IG600 Series Intelligent Gateway
User's Manual

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Preface

Welcome to the IG601 series industrial gateway user manual. This manual will guide you on how to configure the IG601.

This preface includes the following contents:

- Intended Users
- Conventions in the Manual
- Obtaining Documentation
- Technical Support
- Feedback

Intended Users

This manual is intended for the following users:

- Network architects
- On-site technical support
- Network administrators
- Any other network staff

Conventions in the Manual

- To help guide the reader, the manual will use the following conventions.

Format	Description
< >	Content in angle brackets "< >" indicates a button name. For example, the <OK> button.
""	"" indicates a window name or menu name. For example, the pop-up window "**New User.**"
>>	A multi-level menu is separated by the double brackets " >>." For example, the multi-level menu **File >> New >>Folder** indicates the menu item [Folder] under the sub-menu [**New**], which is under the menu [**File**].

- Various Signs

The manual also uses a variety of eye-catching signs to indicate the places where special attention should be paid. The significances of these signs are as follows:

Attention	Attention indicates something very important. Improper operation may cause data loss or damage to the device.

	A brief overview on a procedure.

Obtaining Documentation

The latest product information is available on the InHand website, www.inhandnetworks.com.

Specific documentation can be found in these areas:

- **Support >> Technical Support:** Product information on hardware installation, software upgrade, configuration, manuals and more are available.

- **Products >> Industrial Intelligent >> IG600:** An introduction to the Intelligent Gateway 600, along with manuals, data sheets, a quick guide, and other support documentation. Other products can be found by browsing through the products menu.
- **Support >> Software Download:** Software updates, webinars and technical papers are available for download.

Technical Support

InHand is invested in supporting our products with fast and reliable customer service. Feel free to email.

E-mail: support@inhandneworks.com

Website: www.inhandnetworks.com

Feedback

If you have any comments or questions on your products, please send us feedback via email.

E-mail：info@inhandnetworks.com

Your feedback is vital to improving our products.

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IG601 Introduction

This chapter includes the following parts：

- Overview
- Product Features

1.1 Overview

The InGateway601 (IG601) combines 3G networks, intelligent protocol conversion, and VPN technology to create a product designed for remote maintenance and management. The IG601 features remote communication between the controller and data center, which provides an ingress (or gateway) for the remote diagnosis and maintenance of the machines. The controller technicians can construct large-scale networks for remote maintenance of equipment. The IG601 can also be employed as a communication gateway for equipment to coordinate with each other.

With the IG601, technicians in the office can remotely program field PLCs, monitor variables and receive alerts in real time. The IG601 supports both communication via the PLCs Ethernet port and via the serial port. IG601 also supports status queries, PLC controls and alarm message via SMS. The IG601 series utilizes the ubiquitous cellular network to the fullest and opens new horizons in remote management and machine to machine communication.

1.2 Product Features

- **Designed for the Communication of Industrial Equipments**
  - **SMS Function：**

    SMS Alarm: users can receive timely alarm message when PLC exception occur in field.

    SMS Check and Control: users can remotely monitor and control PLC.

    PLC Collaboration: PLCs can communicate with each other via SMS, ensuring more PLCs work collaboratively.
  - **Remote Maintenance**

Users can achieve PLC's remote programming via secure channel (serial/Ethernet pot)

- **Remote Monitoring:**

  IG601 can check real-time operating status (variable) and send it to data center regularly through 3G/2G network. Users can check PLC's operation and alarm messages anywhere via internet.

■ **Industrial Design**

- In the aspects of EMC, anti-static grade, anti-surge level and wide temperature range, IG601 meet the requirements of industrial and operate easily under harsh environments.
- Metal enclosure. IP30.
- All EMC grade reach level 3.
- Ethernet port supports 1.5kv isolation transformer protection
- Serial port support 15kv ESD protection.
- Wide temperature range: -20℃~70℃.
- Wide voltage range: DC: 12-24V.

■ **Complete Security**

- **Data Transmission Security**

  InGateway 601 uses encrypted channel to communicate with remote controller, enabling the process of updating PLC program enjoys high level of encryption, which is comparable to that of the financial industry.

- **Network Protection Security**

  With powerful firewall features, InGateway601 supports SPI State Inspection, Secure Shell (SSH), Intrusion Protection, DDoS Defense, Attack Defense, IP-MAC binding, etc, protecting the equipment against external network attack.

- **Equipment Management Security**

Multi-level authorization security mechanism realizes centralized authentication and authorization management of equipment.

Login Gateway

This chapter covers the following:

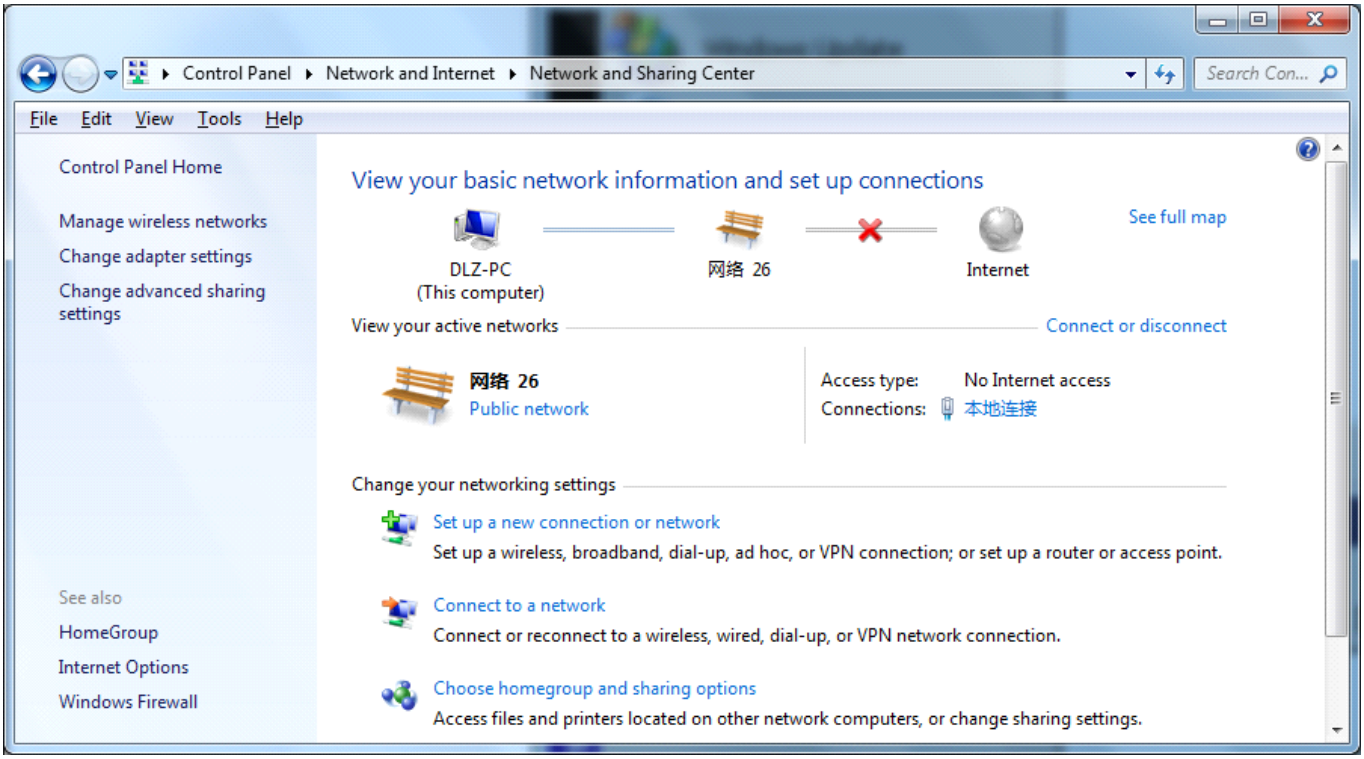
- Establish Network Connection
- Test the connection between supervisory PC and InGateway
- Cancel the Proxy Server

2.1 Establish Network Connection

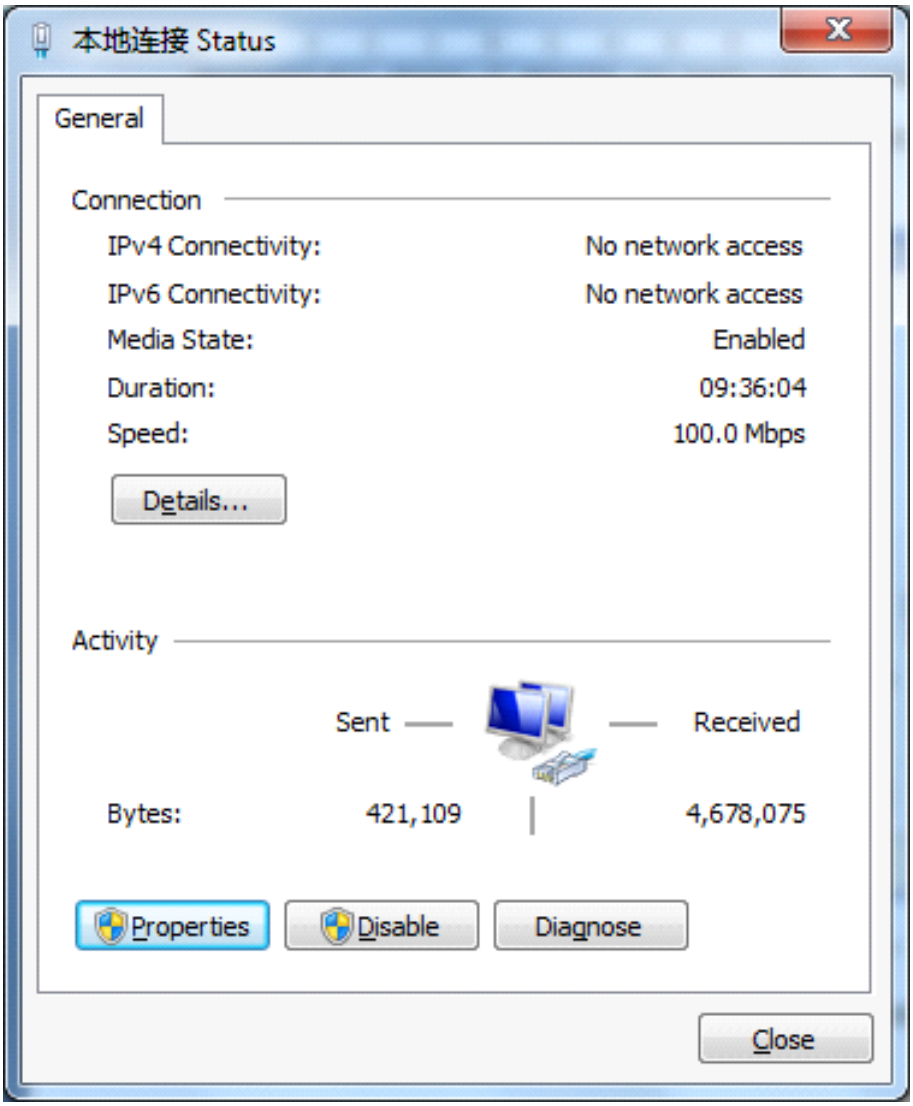
2.1.1 Automatic acquisition of IP address

Please set the supervisory PC to "**automatic acquisition of IP address**" and "**automatic acquisition of DNS server address**," which is the default configuration of Windows. This way, the InGateway automatically assign an IP address to the supervisory PC using DHCP.

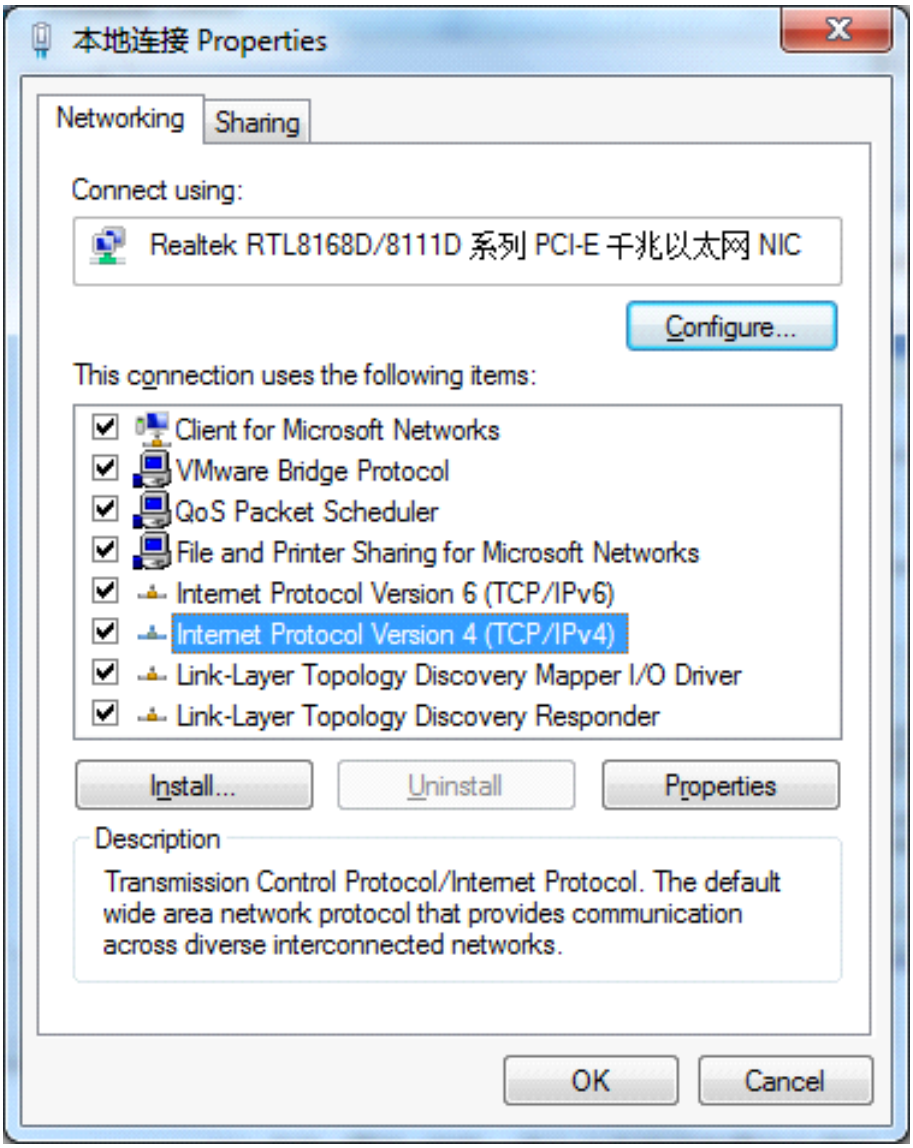
Open "**Control Panel**", double click "Network and Internet" icon, and enter "**Network and Sharing Centers**"


Control Panel ▸ Network and Internet ▸ Network and Sharing Center
Search Con...
File Edit View Tools Help
Control Panel Home
Manage wireless networks
Change adapter settings
Change advanced sharing settings
View your basic network information and set up connections
See full map
DLZ-PC
(This computer)
网络 26
Internet
View your active networks
Connect or disconnect
网络 26
Public network
Access type: No Internet access
Connections: 本地连接
Change your networking settings
Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.
Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.
Choose homegroup and sharing options
Access files and printers located on other network computers, or change sharing settings.
See also
HomeGroup
Internet Options
Windows Firewall

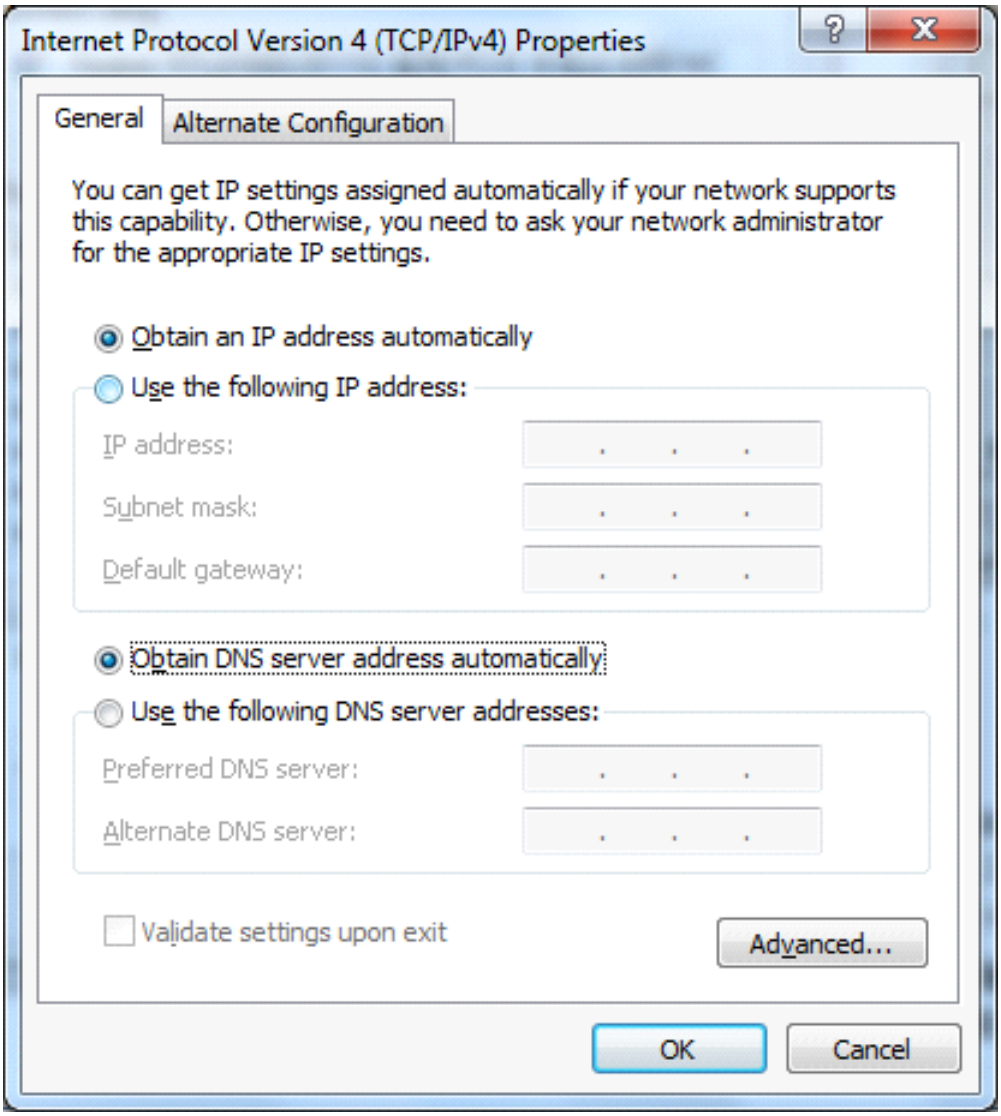
Click the button <Local Connection> to enter the window "**Local Connection Status**"



Click <Properties> to enter the window "**Local Connection Properties**", as shown below.

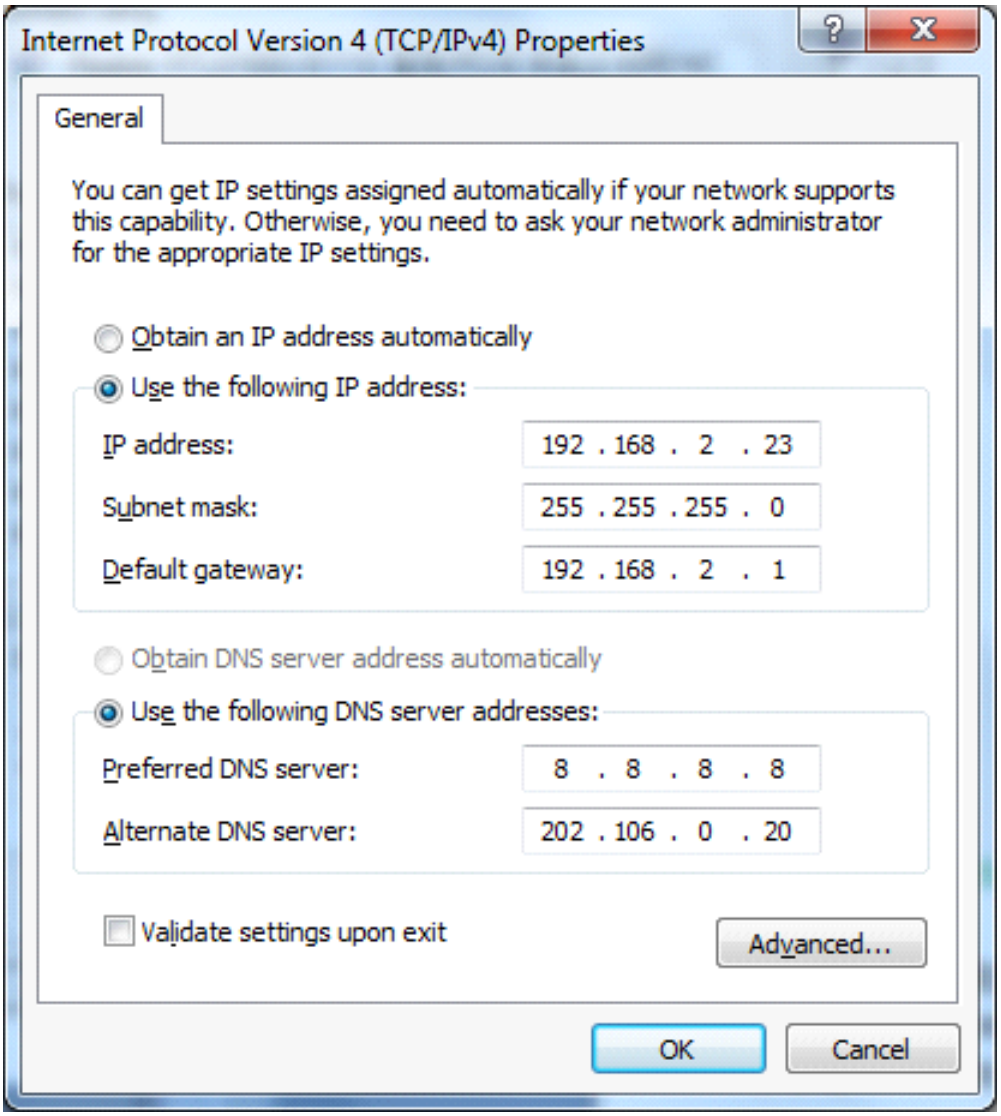


Select "**Internet Protocol Version 4 (TCP/IPv4)**." Click <Properties> to enter "**Internet Protocol Version 4(TCP/IPv4) Properties.**" Select "**Obtain an IP address automatically**" and "**Obtain DNS Server address automatically**," then click <OK> to complete the process, as shown below.


Internet Protocol Version 4 (TCP/IPv4) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

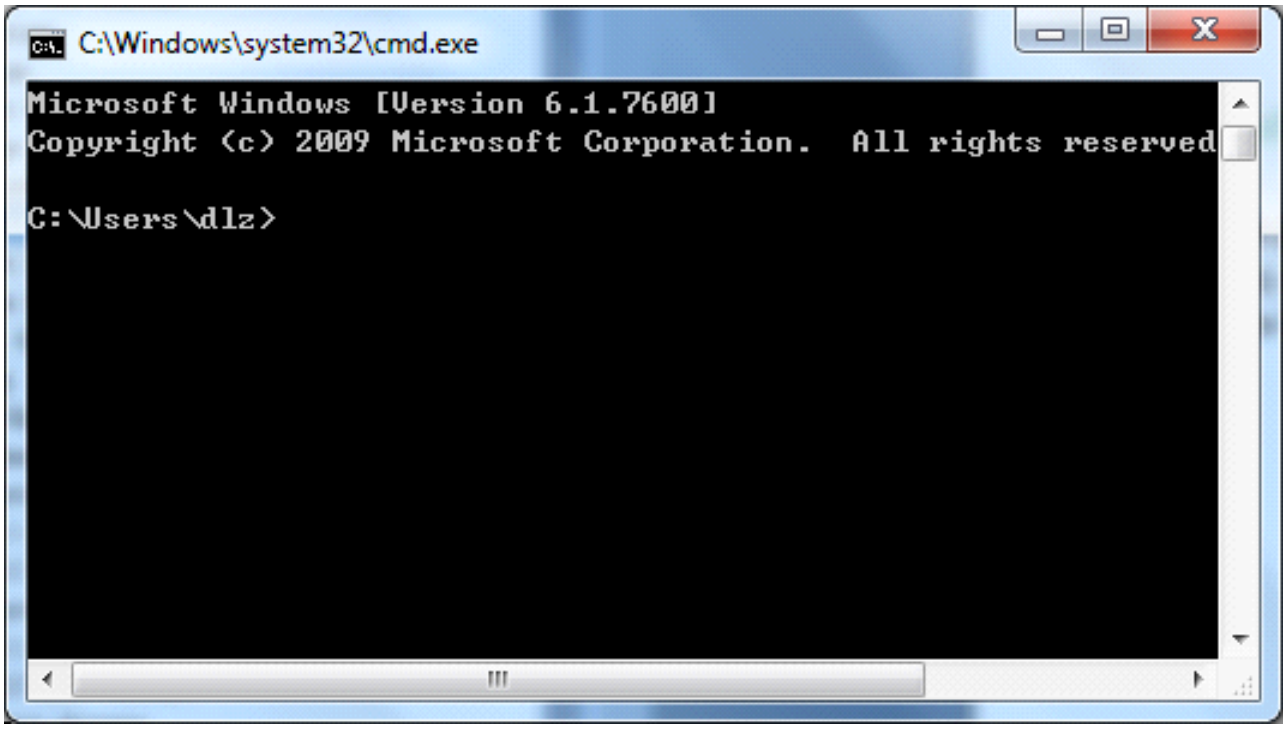
2.1.2 Set a static IP address

Please set the supervisory PC's IP address in the same subnet as the gateway FE (or fast Ethernet) port. In this example, the default IP address of gateway FE port is 192.168.2.1, and the subnet mask is 255.255.255.0. Enter the "**Internet Protocol Version 4 (TCP/IPv4) Properties**" window. Then, select "Use the following IP address", type the IP address (arbitrary value between 192.168.2.2 - 192.168.2.254), subnet mask (255.255.255.0), and default gateway (192.168.2.1) into the text boxes. Finally, click <OK> to finish setting a static IP, as shown below.

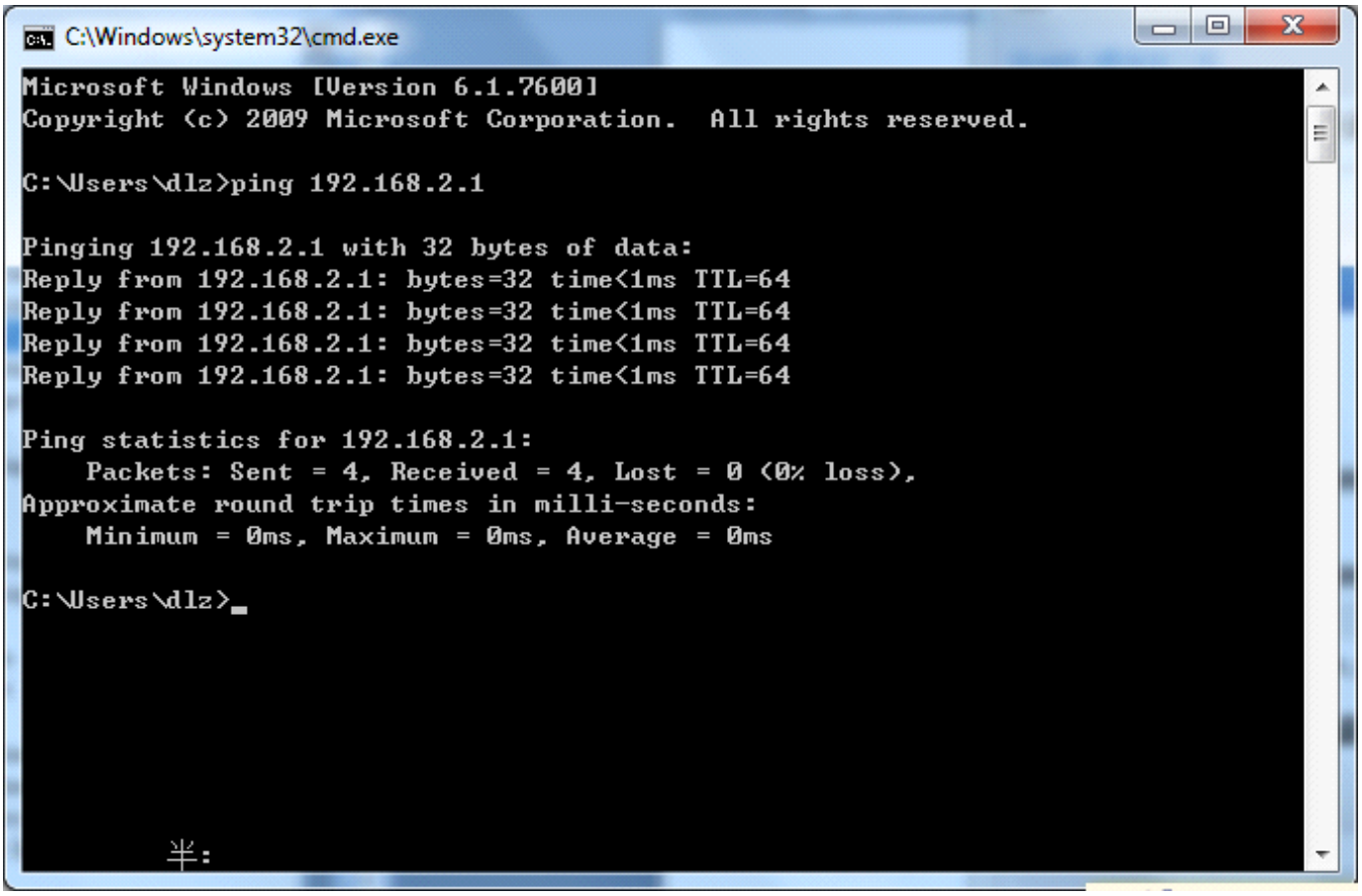

Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 2 . 23
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 192 . 168 . 2 . 1
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server: 8 . 8 . 8 . 8
Alternate DNS server: 202 . 106 . 0 . 20
Validate settings upon exit
Advanced...
OK
Cancel

2.2 Test the network connection between the supervisory PC and InGateway.

1) Click the button <Start> at the lower left corner. Type “cmd” into the field, and run cmd.exe.



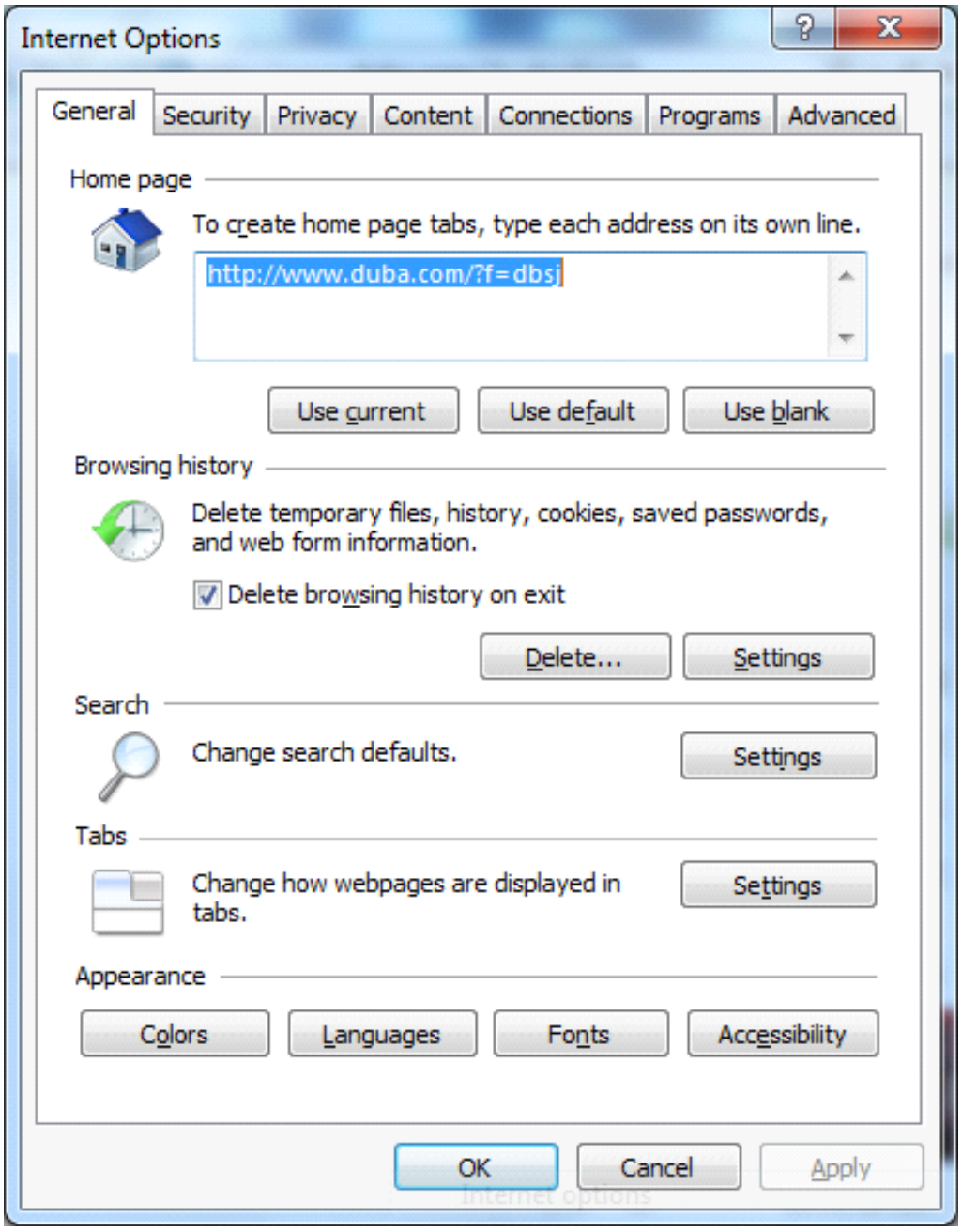
2) Enter “ping 192.168.2.1” and click the <OK> button. (192.168.2.1 is the default IP address of the InGateway). If the connection is good, you will see four returned packets. If there is no response, be sure to check your connection and your supervisory PC's network settings.



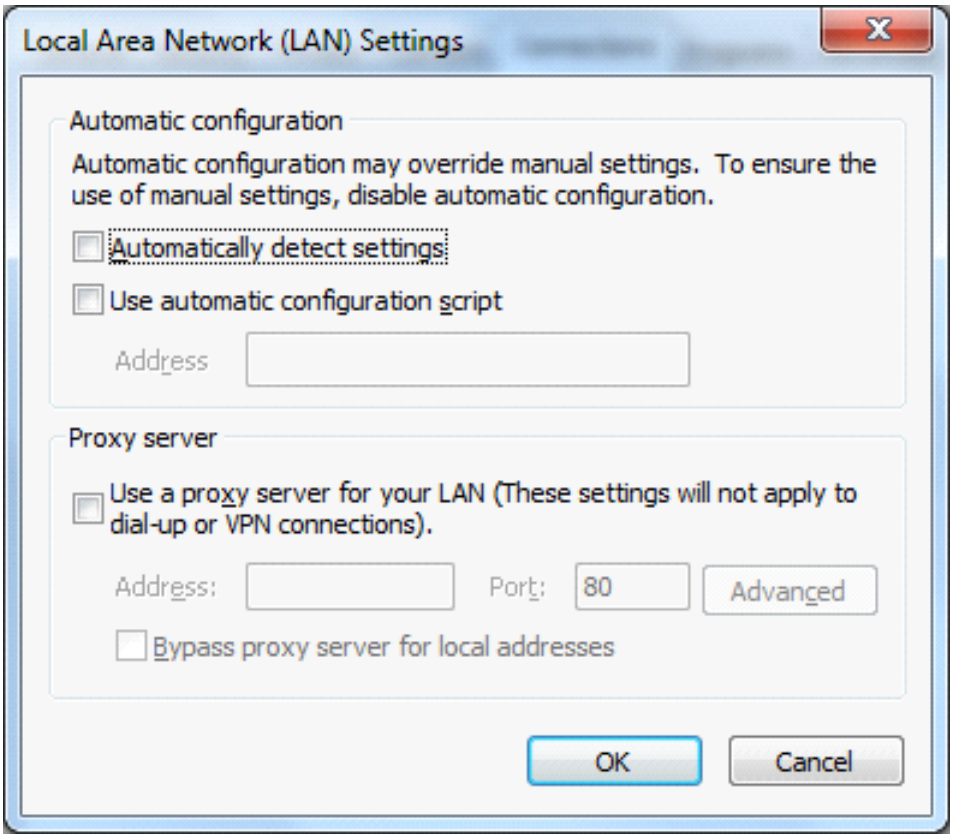
2.3 Disconnect from the Proxy Server.

If the supervisory PC uses a proxy server to access the Internet, it is necessary to disconnect from the proxy and remove any proxy settings. The operating steps are as follows:

- Open Internet Explorer.
- Select **Tools>>Internet Options** to enter the window "**Internet Options**".



- Select the tab "Connect" and click the button <LAN Setting(L)> to enter the window "**LAN Setting**." If the option "**Use a Proxy Server for LAN**" is checked, *uncheck* it. Click the <OK> button and continue to the web configuration section of the manual.


Local Area Network (LAN) Settings
Automatic configuration
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.
Automatically detect settings
Use automatic configuration script
Address
Proxy server
Use a proxy server for your LAN (These settings will not apply to dial-up or VPN connections).
Address:
Port:
80
Advanced
Bypass proxy server for local addresses
OK
Cancel

Web Configuration

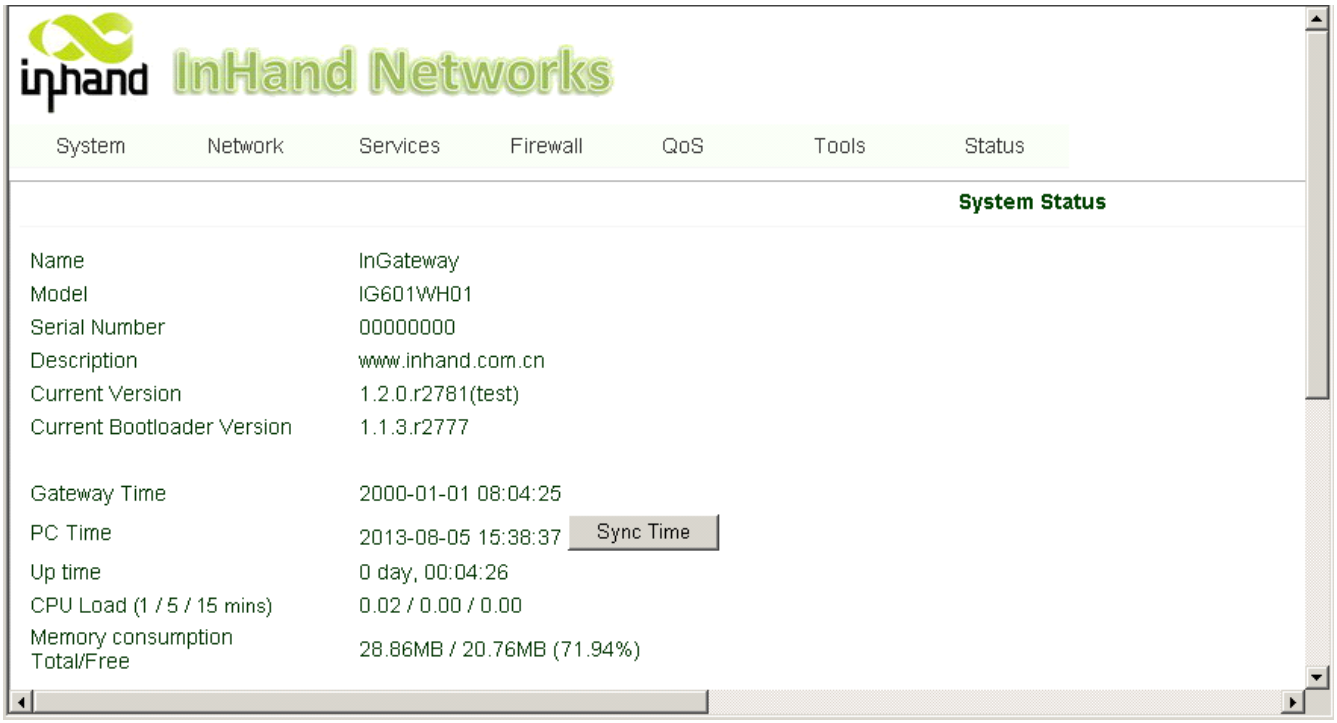
This chapter covers the following contents:

- Logging in the Browser Interface
- System
- Network
- Service
- Firewall
- QoS
- Tools
- Status

3.1 Login the Web Configuration Page of Gateway

Run the Web browser, enter "http://192.168.2.1" in the address bar, and press Enter to skip to the Web login page, as shown below. Enter the "User Name" (default: adm) and "Password" (default: 123456).

Click button <Login> or directly press Enter to enter the Web configuration page, as shown below.



Click <Sync Time> to synchronize the gateway's clock with the system time of the host.

Instruction

For security, it is highly recommended that you modify the default password after your first login. Store the password information in a secure location.

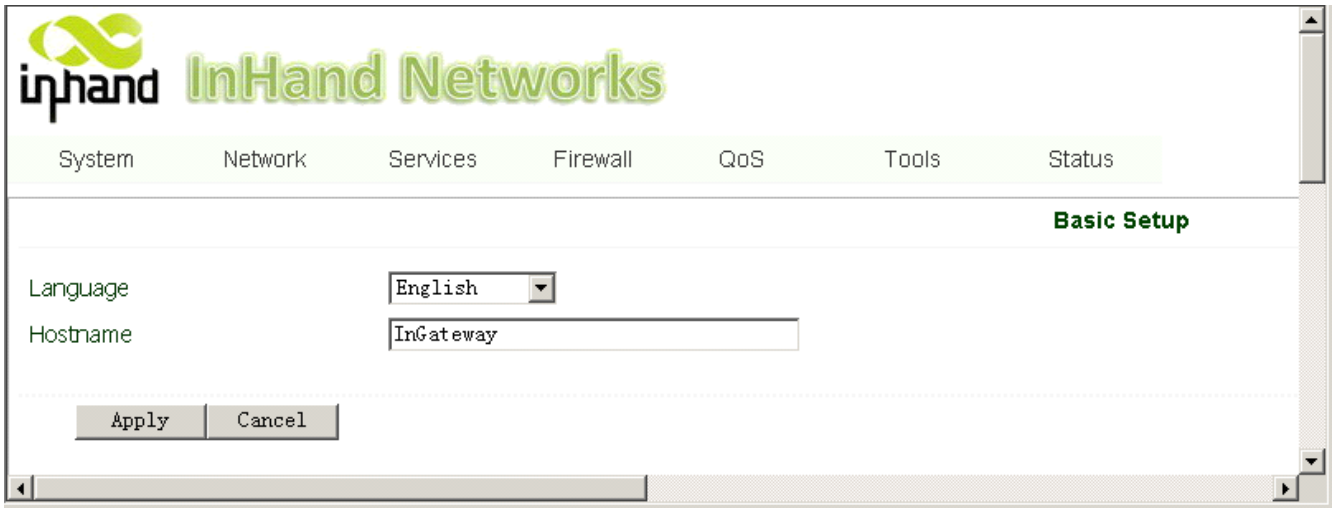
3.2 System

The system configuration process involves nine steps:

- Basic Setup
- Time
- Serial Port
- Admin Access
- System Log
- Configuration Management
- Update
- Reboot
- Logout

3.2.1 Basic Setup

From the navigation panel, select **System >> Basic Setup**, then enter the "**Basic Setup**" page, as shown below.

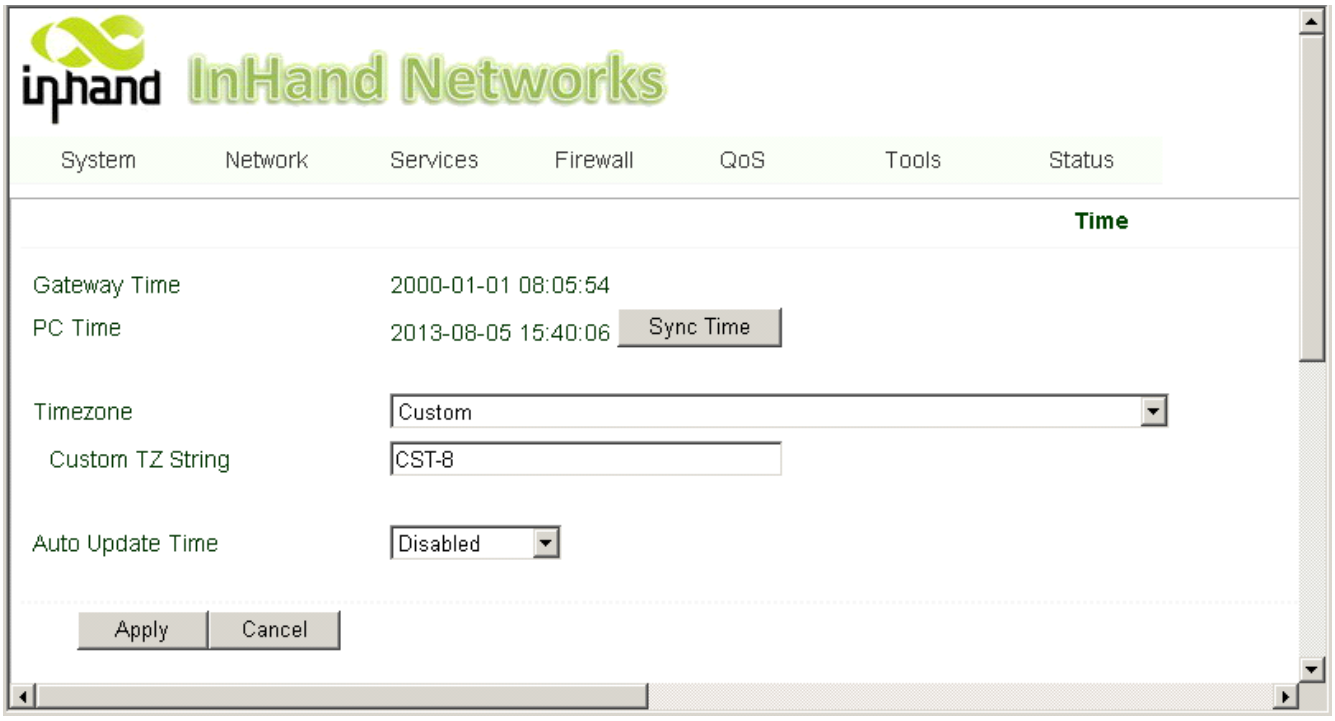


Page description is shown below:

Parameters	Description	Default
Language	Select the language of configuration page	English
Hostname	Set the name of InGateway	Gateway

3.2.2 Time

In order to ensure the coordination of the gateway and other devices, users need to set the system time and time zone correctly. From the navigation panel, select **System >> Time** then enter the "**Time**" webpage, as shown below. Click <Sync Time> to synchronize the time of the gateway with the system time of the host.



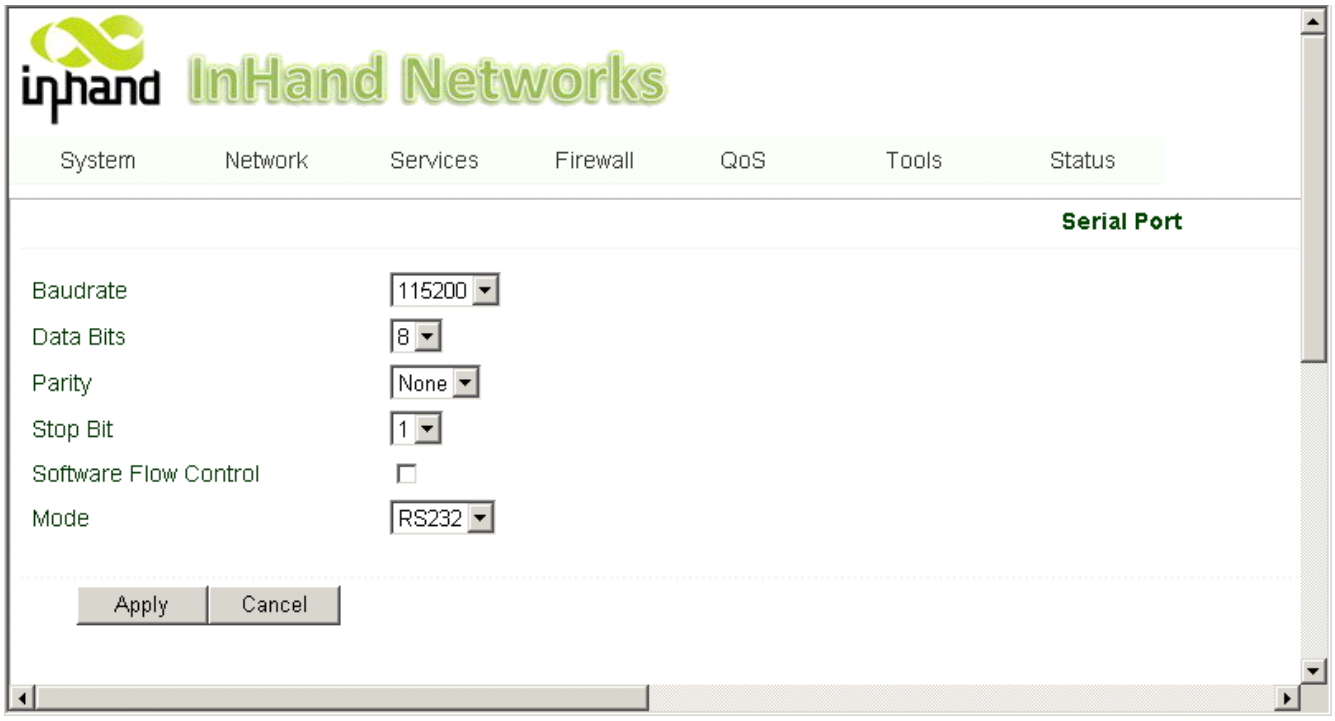
The terms are explained below:

Parameters	Description	Default
Gateway Time	Display the system time of Gateway	2000-01-01 08：16：47
PC Time	The current time of supervisory PC	N/A
Timezone	Set time zone	Custom
Custom TZ String	Set the time zone of the Gateway	CST-8
Auto update Time	Time Update Interval	Disabled

3.2.3 Serial Port

On the serial port settings config page, users need set the serial configuration of the gateway with the same parameters as the connected device. If users are using software similar to PuTTY, users should set their serial configs the same as the settings below.

From the navigation panel, select **System >> Serial Port**, then enter "**Serial Port**" page, as shown below.



Page description is shown below:

Parameters	Description	Default
Baud Rate	Serial baud rate	115200
Data Bit	Serial data bits	8
Parity	Set parity bit of serial data	None
Stop Bit	Set stop bit of serial data	1
Software Flow Control	Enable Software Flow Control	Disable
Mode	Select serial type	RS232

3.2.4 Admin Access

HTTP

HTTP (Hypertext Transfer Protocol) is used for transferring web pages on Internet. After enabling HTTP service on device, users can log on via HTTP and access the device using a web browser.

HTTPS

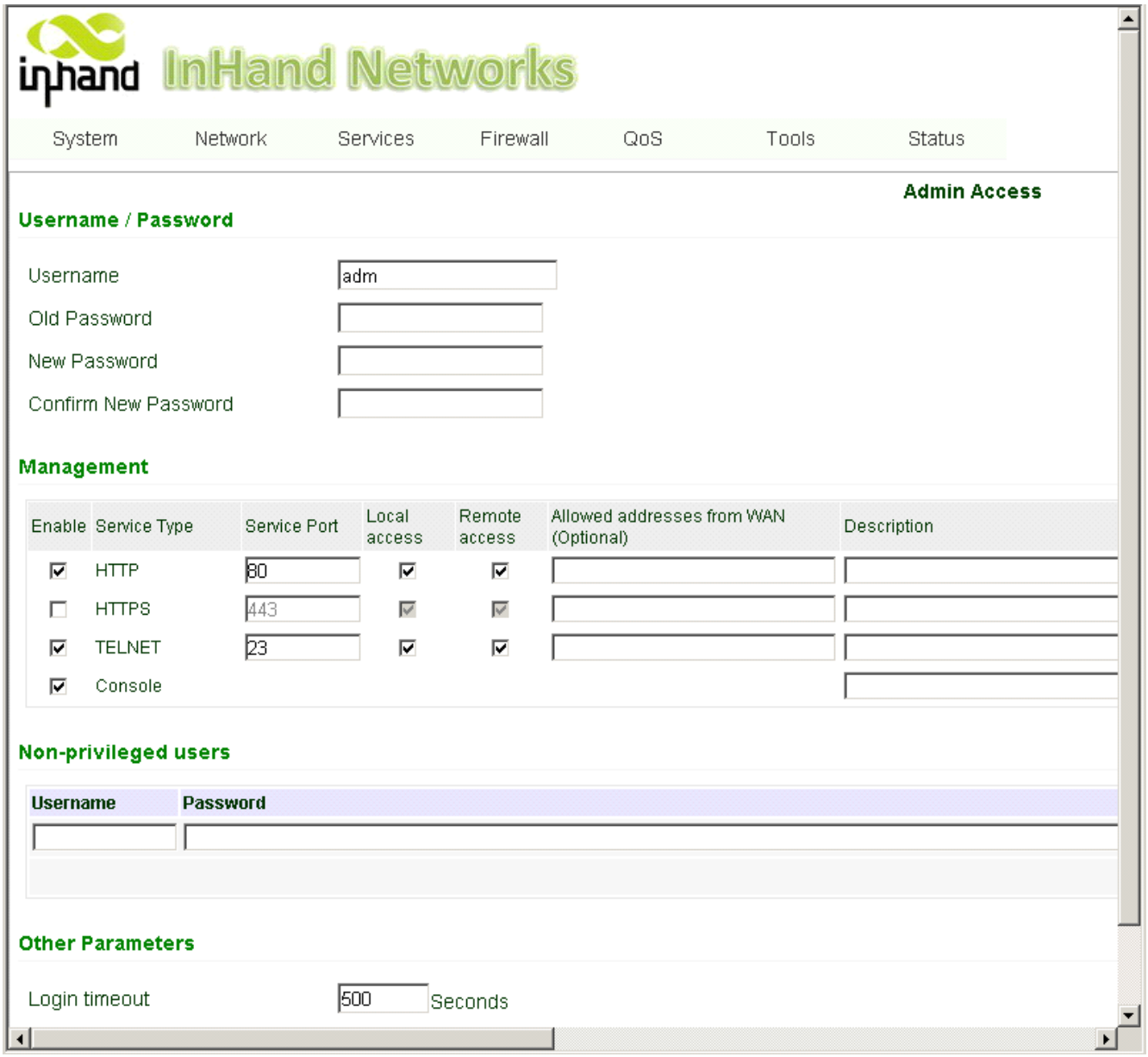
HTTPS (Secure Hypertext Transfer Protocol) supports SSL (Security Socket Layer) and encrypts data transfers. This prevents man-in-the-middle attacks when data passes either through the local network or across the internet.

TELNET

Telnet protocol provides telnet and virtual terminal functions through a network. The device supports both a client mode and a server mode. In client mode, the telnet client sends request to the telnet server, creating a session. While in server mode, the device supports Telnet connections for incoming clients, allowing for remote access.

Console

The console port, also called the access or serial port, refers for initial configuration and subsequent management of a device. It has the same terminal as the telnet client. From the navigation panel, select **System >> Admin Access**, then enter "**Admin Access**" page, as shown below.



Page description is shown below:

Parameters	Description	Default
Username	Username for configuration web login .	adm
Old Password	To change the password, users must input the old one.	N/A
New Password	Input new password.	N/A
Confirm New Password	Input the new password again.	N/A
Management：HTTP/HTTPS/TELNET/Console		
Enable	Select to enable HTTP.	Enabled
Service Port	Select management port.	80/443/23/N/A
Local Access	Enable—allow management of the IG601 over the local network,	Enabled

Remote Access	or LAN. Disable—forbid management of the IG601 over LAN. Enable—allow management of the IG601 over the WAN, or internet. Disable—forbid management on a WAN connection.	Enabled
Allowed Access from WAN (Optional)	Set the range of IP address that is allowed access over a WAN connection. For example 192.168.2.1/30 or 192.168.2.1 - 192.168.2.10. (HTTP/HTTPS/TELNET)	N/A
Description	Describe the parameters of management (non-influence to IG601)	N/A
Parameters	**Description**	**Default**
Non-priviledged Users(Console login)		
Username	Technician defines a new username.	N/A
Password	User define the password	N/A
Other Parameters		
Log Timeout	Log Timeout	Log Timeout

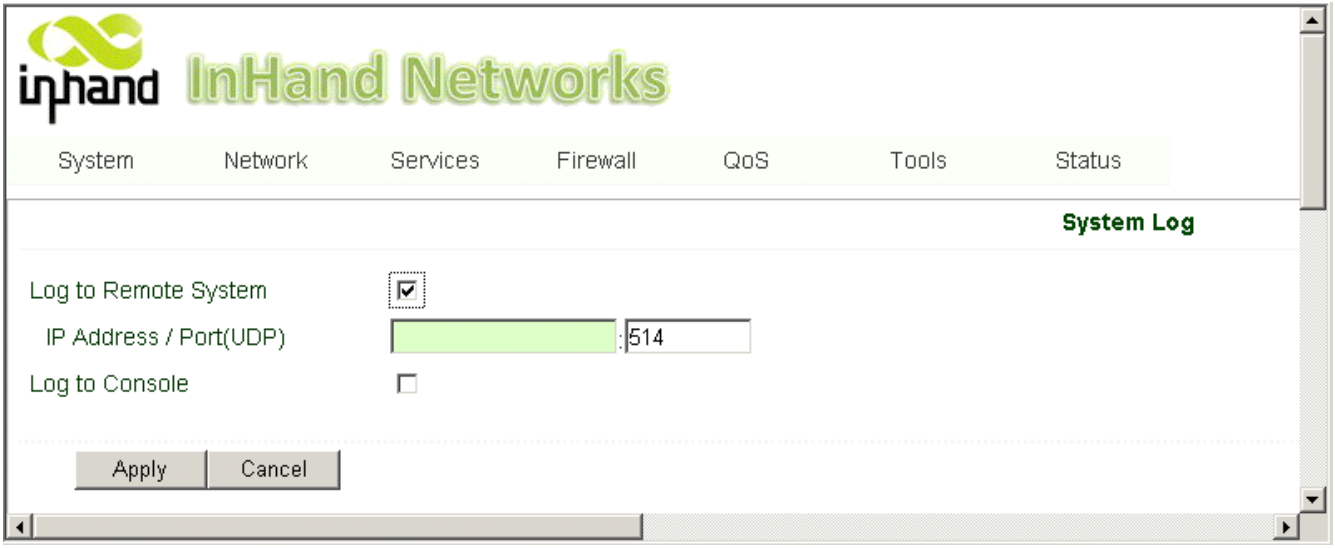
Instruction

- In “Username/Password” section users can modify username and password. However, these accounts will be non-privileged, meaning the new users cannot create new username. A non-privileged account may only do web logins.
- In “Non-privileged Users” section, we can create multiple usernames. Technicians can utilize multiple usernames while logging on a IG601 via serial port or Telnet.

3.2.5 System Log

A remote log server can be set through “System Log Settings,” and all system logs will be uploaded to the remote log server through the gateway. This makes remote log software, such as Kiwi Syslog Daemon, is a necessity on the host.

Kiwi Syslog Daemon is free log server software for Windows, which can receive, record and display logs from host (such as gateway, exchange board and Unix host). After downloading and installing Kiwi Syslog Daemon, it mus be configured through the menus "**File >> Setup >> Input >> UDP**." From the navigation panel, select **System >> System Log**, then enter "**System Log**" page, as shown below.



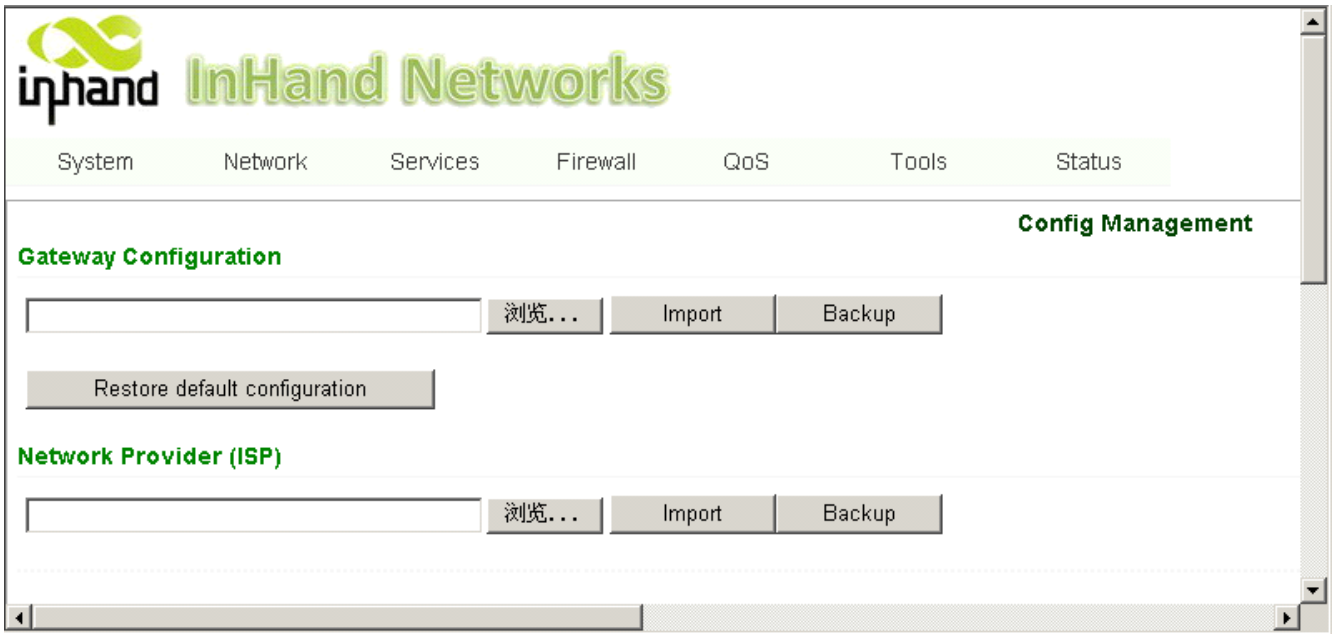
Page description is shown below:

Parameters	Description	Default
Log to Remote System IP address/Port (UDP)	Enable remote log server Set the IP and Port of remote log server	Disable N/A/Port: 514
Log to Console	Print the log to console.	Disable

3.2.6 Config Management

Users may import an old configuration or backup the current configuration.

From the navigation panel, select **System >> Config Management**, then enter the "**Config Management**" page, as shown below.



Page description is shown below:

Parameters	Description	Default
Gateway Configuration	Import/Backup configuration	N/A
Restore default configuration	Click to reset IG601. To complete the reset, users need to reboot the IG601.	N/A
Network Provider (ISP)	The technician must configure the local APN, username, password, and other configs the same as their ISP.	N/A

Attention

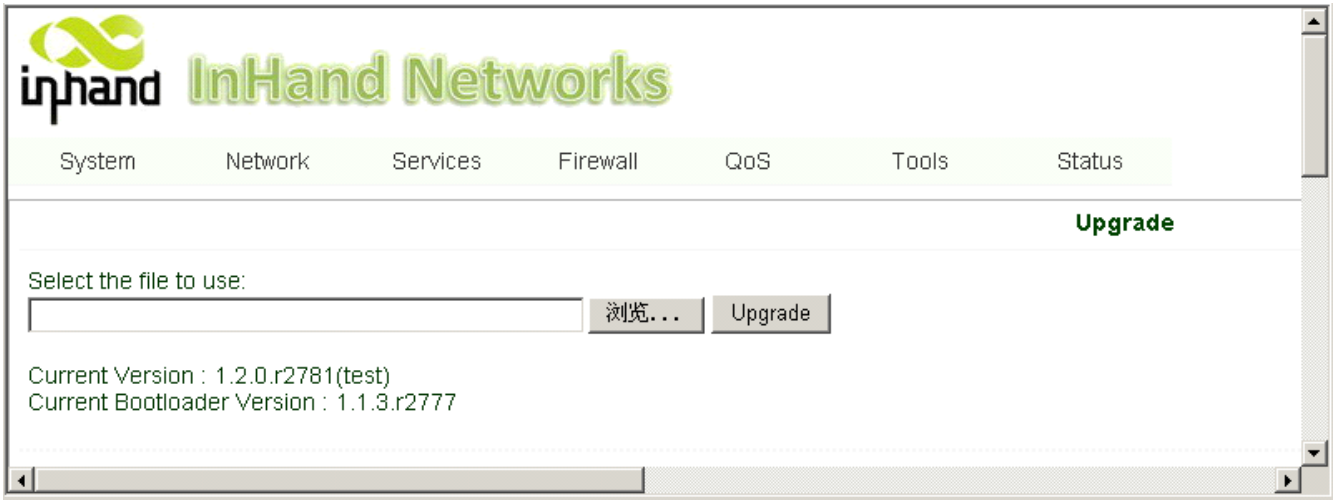
Be sure to check imported configs for incorrect formats and completeness. When importing, the system will filter the improperly formatted commands and save the correct configuration. The good configs will later be serially executed in order after system reboot. The system will not get into expected state in the case that the imported configuration is not arranged according to an effective order.

Instruction

In order not to affect the operation of the current system, when performing an import configuration and restore default configuration, users need to restart the gateway to make the new configuration to take effect

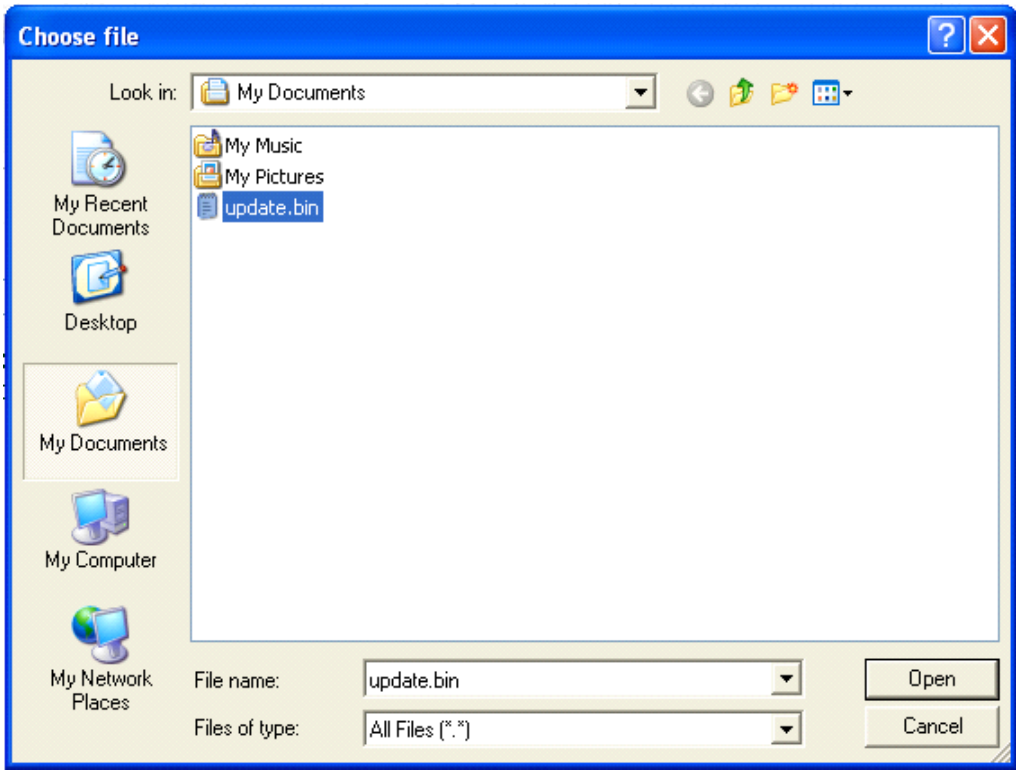
3.2.7 System Upgrade

From the navigation panel, select **System >> Upgrade**, then enter the "**Upgrade**" page, as shown below.



To upgrade the system, click the **System**, tab then <**System upgrade**> to enter upgrade page, then follow the steps below:

Step one: Click <**Browse**> choose the upgrade file, and then click <Open>, as shown below:



Step Two: Click <Update> and then click <OK> to begin updating. Make sure your screen matches the picture below.

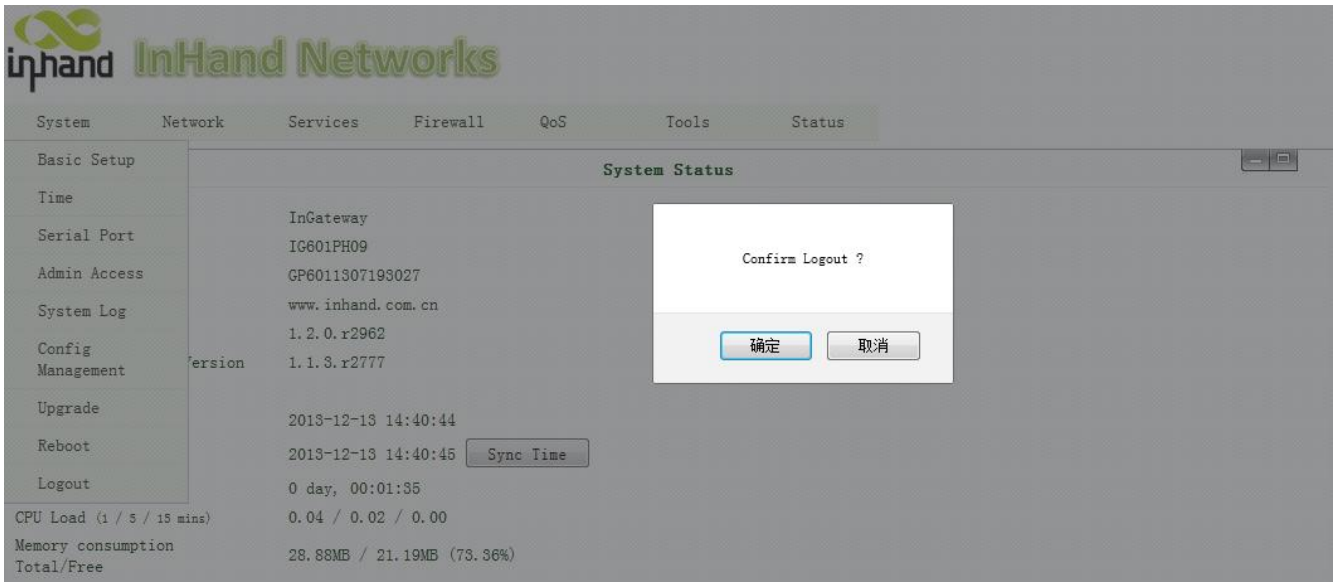
Step Three: Upgrade firmware succeed, and click <**Reboot**> to restart the IG601.

3.2.8 Reboot

If users need to reboot system, please click the System tab, then <Reboot> and click <OK> to restart the system.

3.2.9 Logout

If users want to logout, click **System >> Logout**, and then click <OK>.

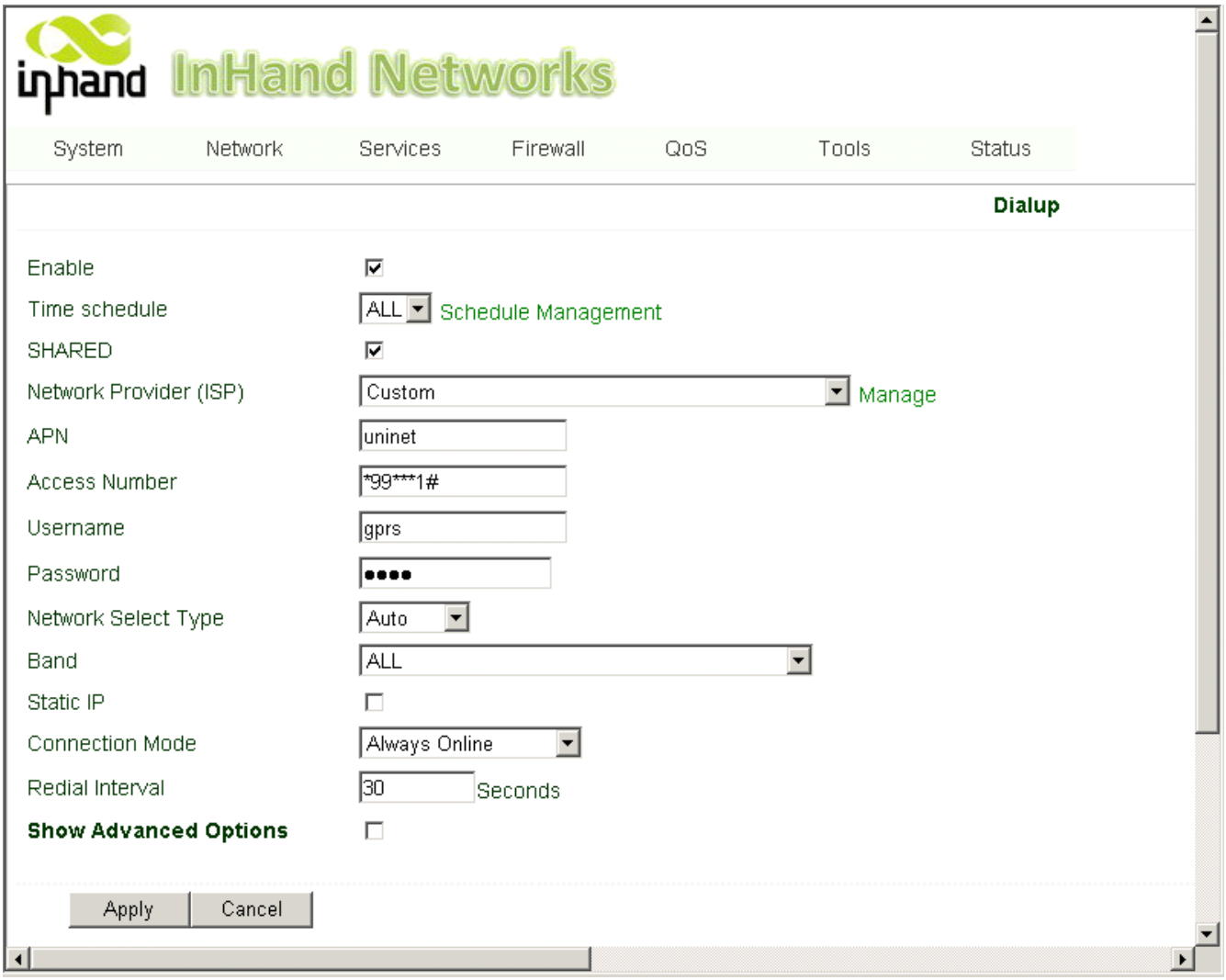


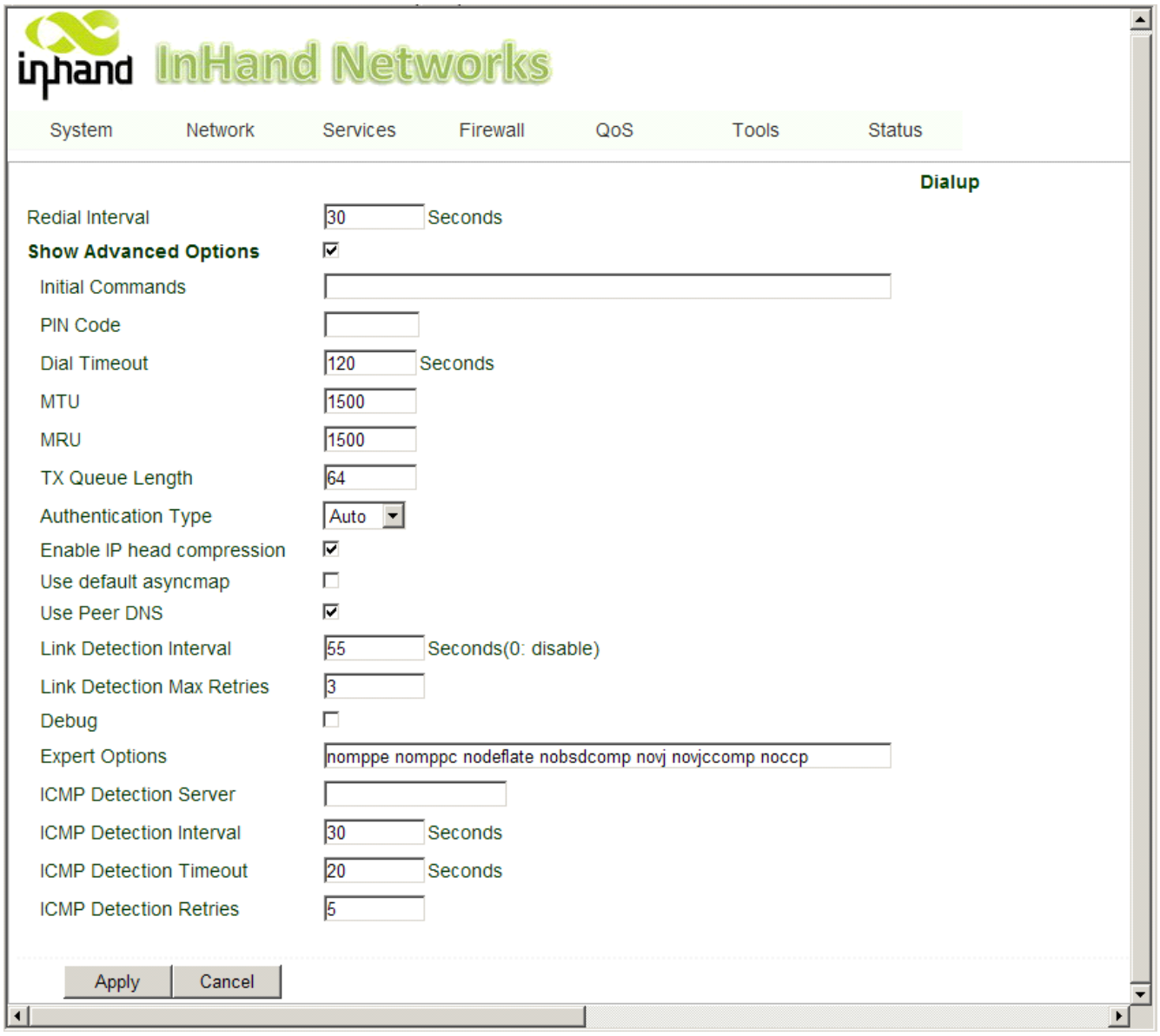
3.3 Network

This section covers network settings include Dialup/Cellular, LAN, DNS, DDNS, and Static Routes.

3.3.1 Dialup/Cellular Connection

With following configuration, IG601 can access the internet through the wireless cellular network. From the navigation panel, select **Network >> Dialup,** then enter the "**Dialup**" tab, as shown below.


InHand Networks
System
Network
Services
Firewall
QoS
Tools
Status
Dialup
Enable
Time schedule
ALL
Schedule Management
SHARED
Network Provider (ISP)
Custom
Manage
APN
uninet
Access Number
*99***1#
Username
gprs
Password
Network Select Type
Auto
Band
ALL
Static IP
Connection Mode
Always Online
Redial Interval
30
Seconds
Show Advanced Options
Apply
Cancel



Terminology is listed below:

Parameters	Description	Default
	Basic Config	
Enable	Enable PPP dialup.	Enable
Time Schedule	Select timetable for online and offline. We need defined timetable through "Schedule Management" in advance.	ALL
SHARED	Enabled—enable "NAT," or network address translation. Local addresses can be translated to global WAN address on a one-to-many basis. Disable—disable "NAT."	Enable
ISP	Select local ISP, if not listed here,	Customer

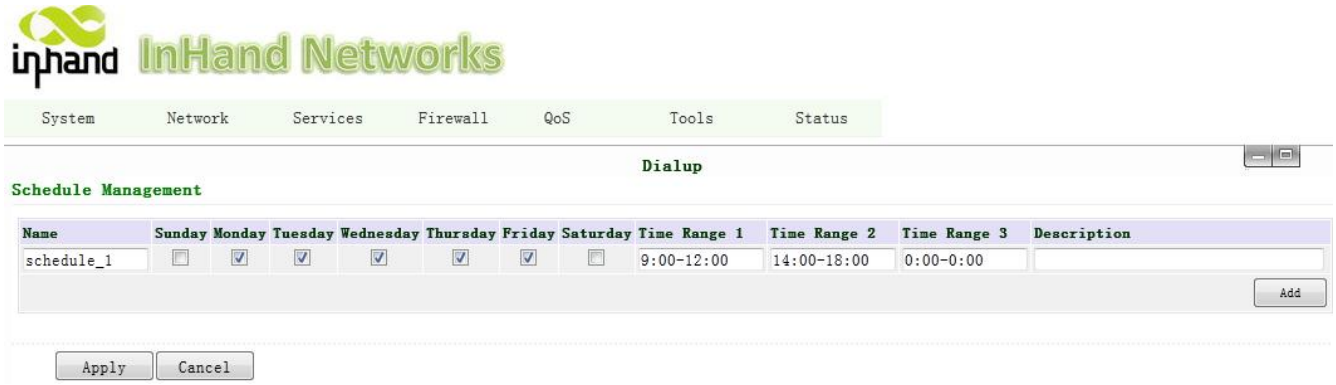
	please select “Customer.”	
APN	APN provided by your **Local ISP**	Unicom
Access Number	Dialup phone number provided by your **Local ISP.**	“*99#” or “*99***1#”
Username	Some APNs need a username and password to complete the PPP connection, but not every APN needs a username.	GPRS
Password	Some APNs need a username and password to do the PPP connection, but not every APN needs a password.	GPRS
Network Select Type	Choose mobile network type. The available options are “auto”, “2G only” and “3G only.”	Auto/ 2G only / 3G only
Static IP	Enable a static IP if your SIM card can get a static IP address.	Disable
Connection Mode	It may be set to either “Always Online,” “Connect On Demand,” or “Manual.”	Always Online
Redial Interval	When a dialup fails, InGateway will redial after an interval.	30 seconds
Advanced Options		
Initial Commands	Used for advanced parameters.	N/A
PIN code	Set the use of the SIM card PIN code.	N/A
Dial Timeout	Set dialup timeout. The IG601 will reboot after timeout.	120 seconds
MTU	Set max transmit unit, or max frame size. Set this number to 1500 for normal frames and larger for little big frames.	1500
MRU	Set max receive units.	1500
TX Queue Length	Set length of transmit queue.	64
Authentication Type	Select either Auto, PAP or CHAP. This is nessecary for some ISP connections.	Auto
Enable IP header compression	Enable IP header compression	Enable
Use default asyncmap	Enable default asyncmap, and PPP advanced option.	Disabled
Use Peer DNS	Use the assigned DNS server.	Enable
Link Detection Interval	Set the Link Detection Interval.	55 seconds
Link Detection Max Retries	Set the max retries if a link detection failed.	3
Debug	Enable debug mode.	Disable
Expert Option	Provide extra PPP parameters, normally user don't need to set these. Options include: nomppe nomppc nodeflate nobsdcomp novj novjccomp	N/A

	noccp.	
ICMP Detection Server	Set the ICMP Detection Server. Blank represents none.	Blank
ICMP Detection Interval	Set the ICMP Detection Interval.	30 seconds
ICMP Detection Timeout	Set ICMP Detection Timeout (IR6X1 will reboot if ICMP time out)	20 seconds
ICMP Detection Max Retries	Set the max number of retries if ICMP failed	5

Attention

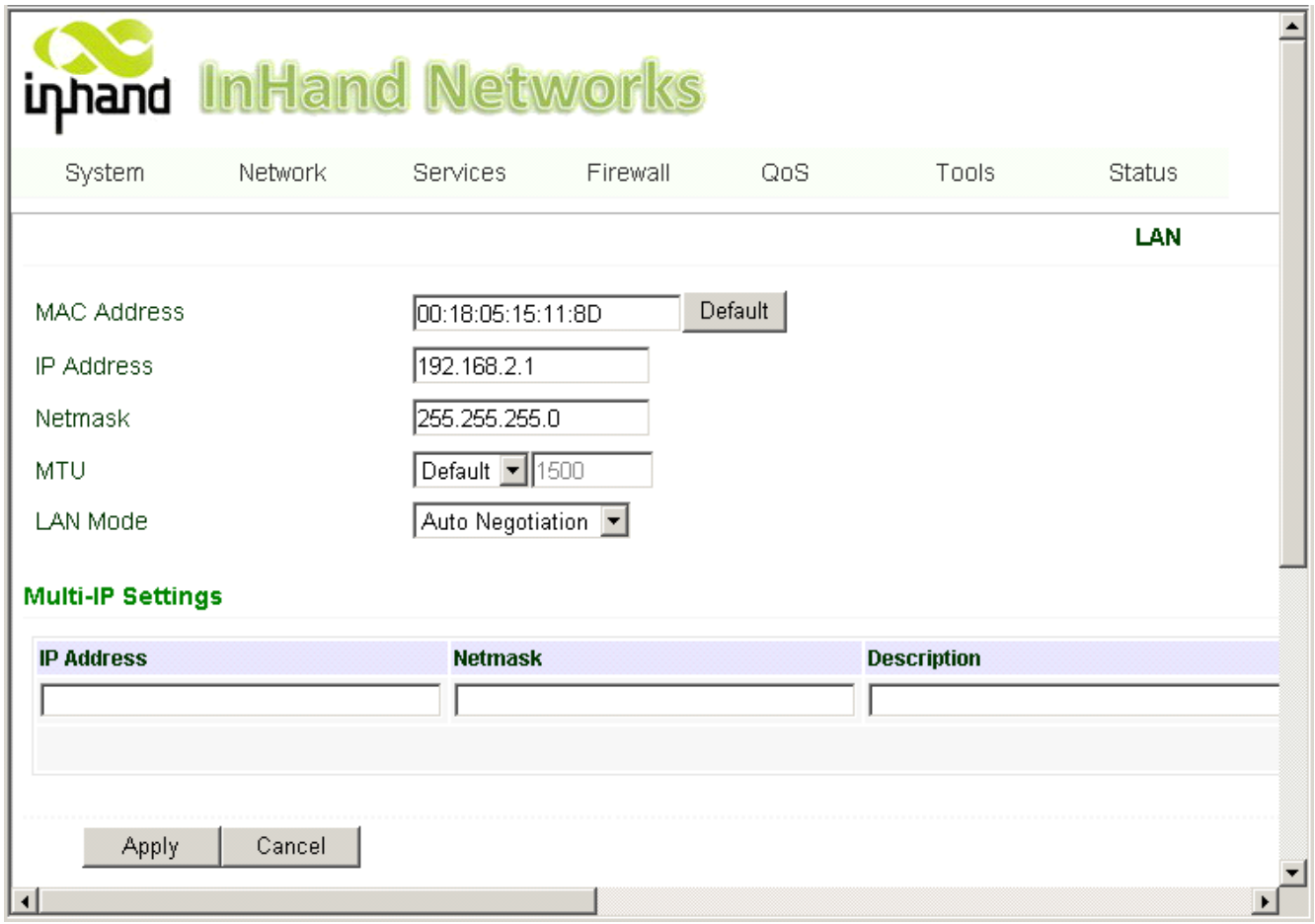
Configure the device's schedule to set any downtime.

To set the devices schedule, go into the "**Dialup**" window, enter the "**Schedule Management**" page.



3.3.2 LAN

To create a static LAN connection, go into the navigation panel, select **Network >> LAN,** then enter the "**LAN**" page, as shown below.



The settings are explained below:

Parameters	Description	Default
MAC Address	The host MAC address in LAN, which is provided by the manufacturers.	00:18:05:15:11:8D
IP Address	Set the IP Address in LAN	192.168.2.1
Net mask	Set the subnet mask of a local network.	255.255.255.0
MTU	Set MTU length options to either Default or Manual. 1500 is the normal frame size for Ethernet v2.	1500
LAN Mode	100M Full/duplex,100M Half/duplex.	Auto Negotiation
Multi-IP Settings		
IP Address	Set additional IP Address of LAN	N/A
Netmask	Set netmask of LAN	N/A
Description	Description about this IP address	N/A

3.3.3 DNS

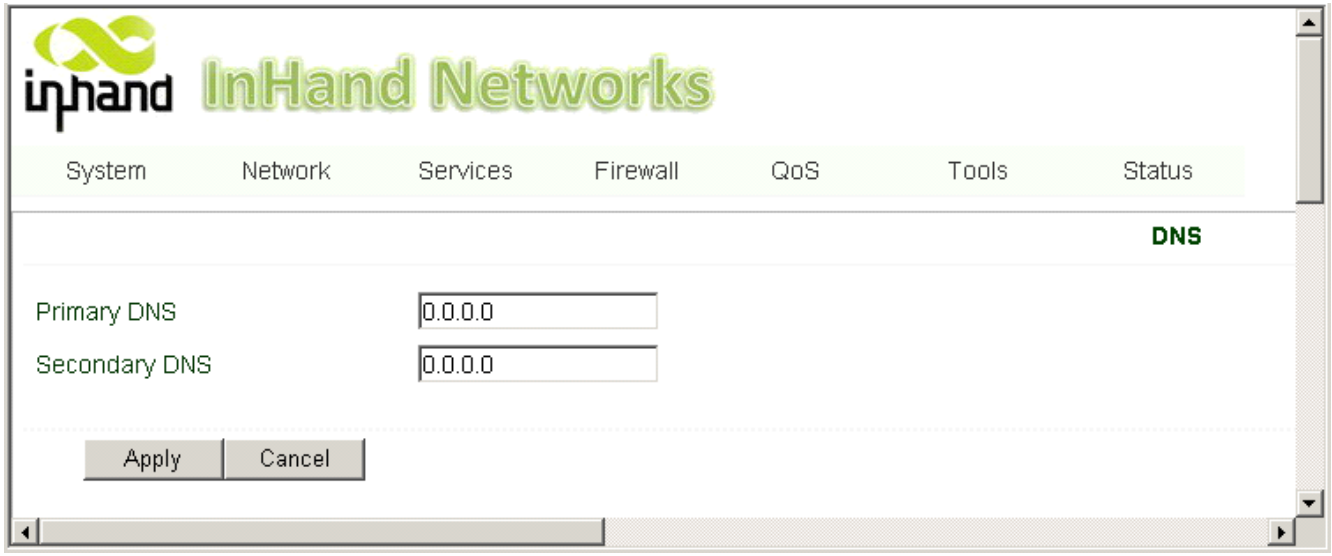
At the core of the internet lies DNS or the domain-name system. It employs a distributed database (DDB) to map domain names and IP addresses across the web. DNS makes it convenient to access the

internet, so that instead of memorizing IP numbers, people can use words to make domain-names.

The device supports the following two functions through the domain name configuration service:

- DNS Server: the device can function as a local DNS Server.
- DNS relay: as a DNS agent, the device can transfer DNS request and response messages between the DNS client and server, while and executing domain name analysis in place of the DNS Client.

To begin setting up the DNS client, find the navigation panel, select **Network**>>**DNS** to enter into the "**DNS**" window and manually set the DNS information. If the DNS information is empty, it can be found via dialup. Generally, users will only need to set the dialup DNS settings if they have static routes on the gateway.



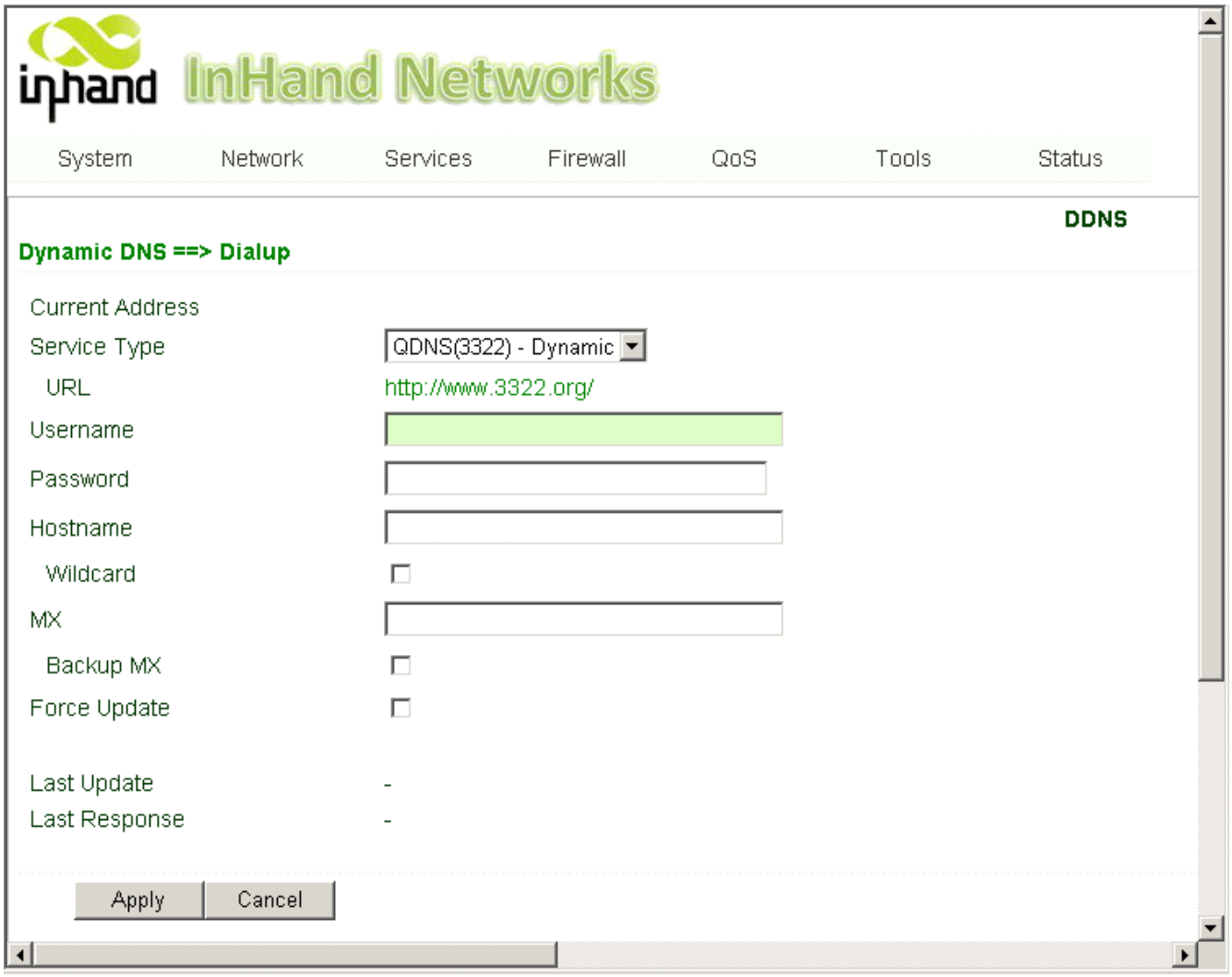
Page description is shown below:

Parameters	Description	Default
Primary DNS	Set Primary DNS	N/A
Secondary DNS	Set Secondary DNS	N/A

3.3.4 DDNS

DDNS (Dynamic Domain Name Server) automatically adds DNS entries to a server in real time. DDNS automatically logs IP addresses and host-names to its database when hosts connect to the network. When hostnames have been recorded, they may be used in the place of IP addresses. DDNS will be particularly useful in an IPv6 environment.

To set up DDNS, go into the navigation panel, select **Network >> DDNS,** then enter "**DDNS**" page, as shown below.



Page description is shown below:

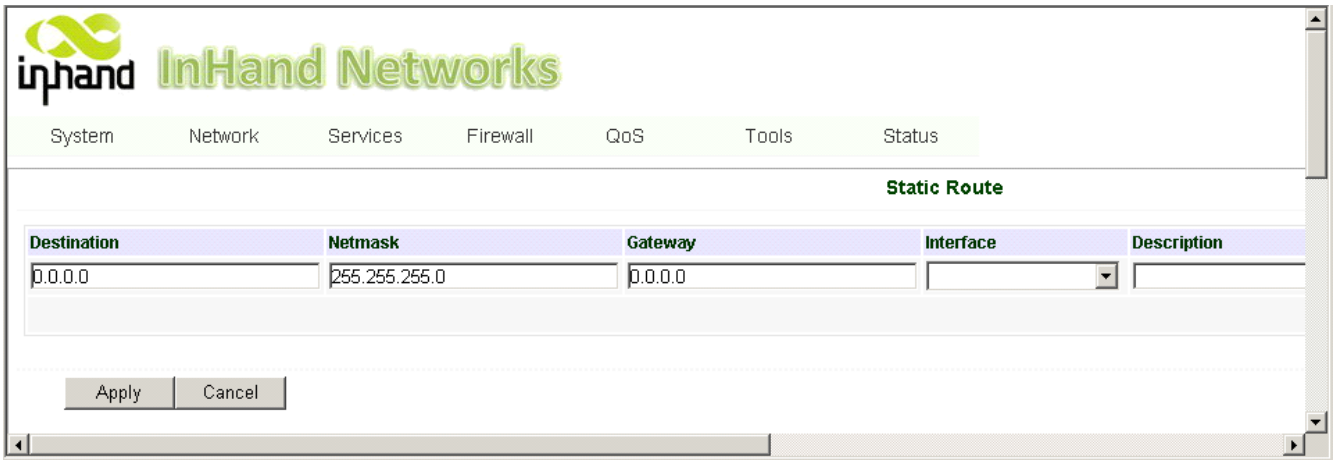
Parameters	Description	Default
Current Address	Show the current IP address	Blank
Service Type	Select DDNS Provider	Disabled
URL	Automatically generate, users do not need to set	http://www.3322.org/
Username	Registered username for DDNS	N/A
Password	Registered password for DDNS	N/A
Hostname	Registered hostname for DDNS	N/A
Wildcard	Set whether the server supports wildcards	Disabled

MX	Whether to update the mailbox record	N/A
Backup MX	Whether to update the mailbox record	Disabled
Force Update	Force update records after modifying the settings	Disabled

3.3.5 Static Routes

Static routes are created manually and have many different uses. After the static route is set, packets will be transferred to appointed routes. Engineers can create simpler networks by using static routes in place of RIP or OSPF, and ensure greater network reliability. The proper setting and use of static routing can also improve the performance of a network and guarantee bandwidth for important network applications.

From the navigation panel, select **Network >> Static Route,** then enter "**Static Route**" page, as shown below.



Page description is shown below:

Parameters	Description	Default
Destination	Set IP address of the destination	0.0.0.0
Net Mask	Set subnet mask of the destination	255.255.255.0
Gateway	Set the gateway of the destination	N/A
Interface	Users can select which interface accesses the destination	N/A
Description	Describe a static route	N/A

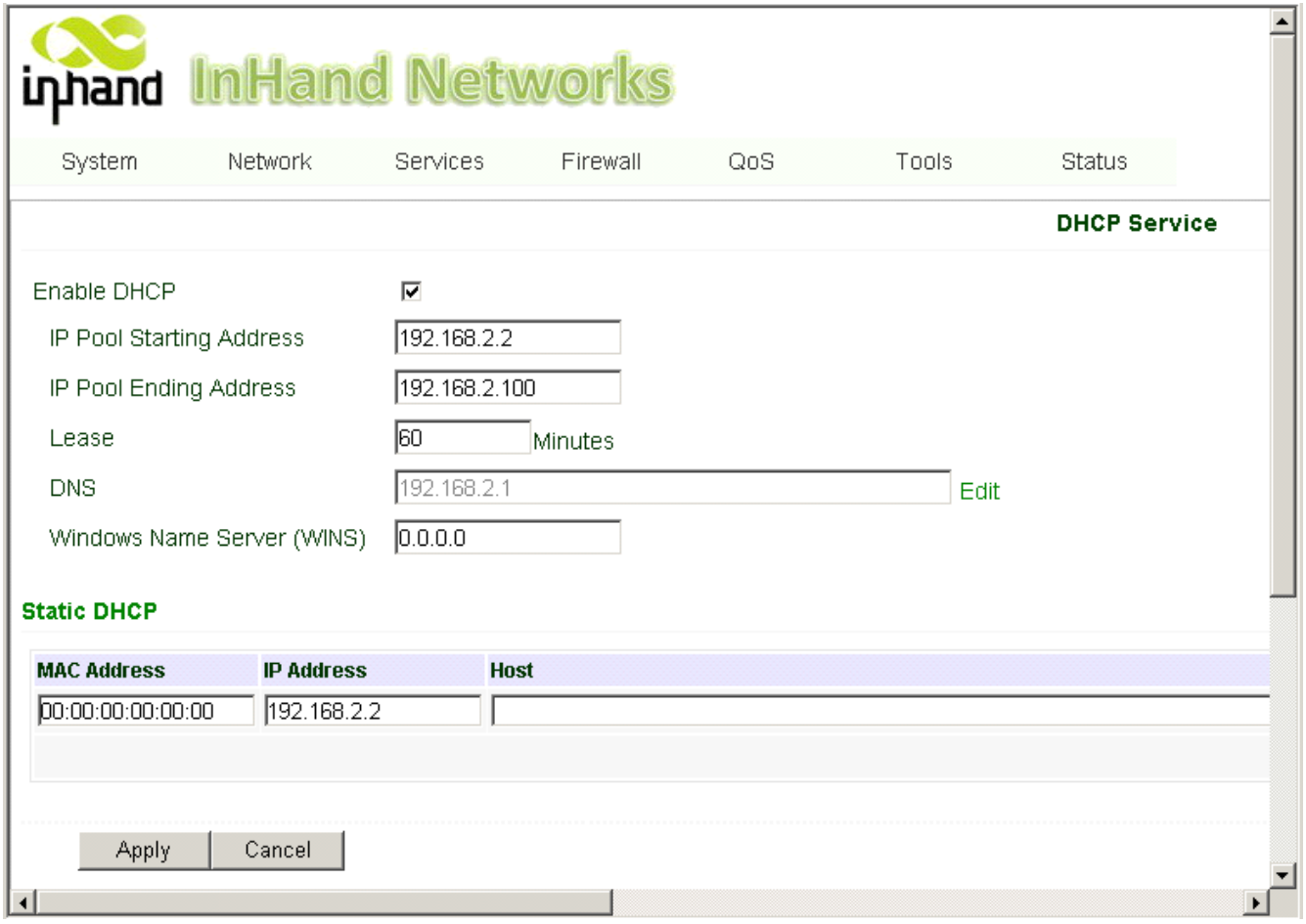
3.4 Service

In the service section, this manual covers nine configurations, including DHCP service, DNS relay, VRRP, Device Manager, DTU, Modbus to SMS, SMS alarm rules, and Mbsms variable template.

3.4.1 DHCP Service

DHCP (Dynamic Host Configuration Protocol) is a network protocol for LAN utilizing UDP and TCP. DHCP automatically distributes IP addresses for either a local network or network service provider, and can aid network administrators in managing all the computers on a network. A DHCP server refers to a computer managing DHCP standard in a network. It distributes IP addresses once the work station logs on and ensures that no duplicate IP addresses are assigned. DHCP Server dramatically simplifies network management tasks, and is a necessity in today's network.

To enable the DHCP server, find the navigation panel, select **Services >> DHCP Service,** then enter "**DHCP Service**" page, as shown below.



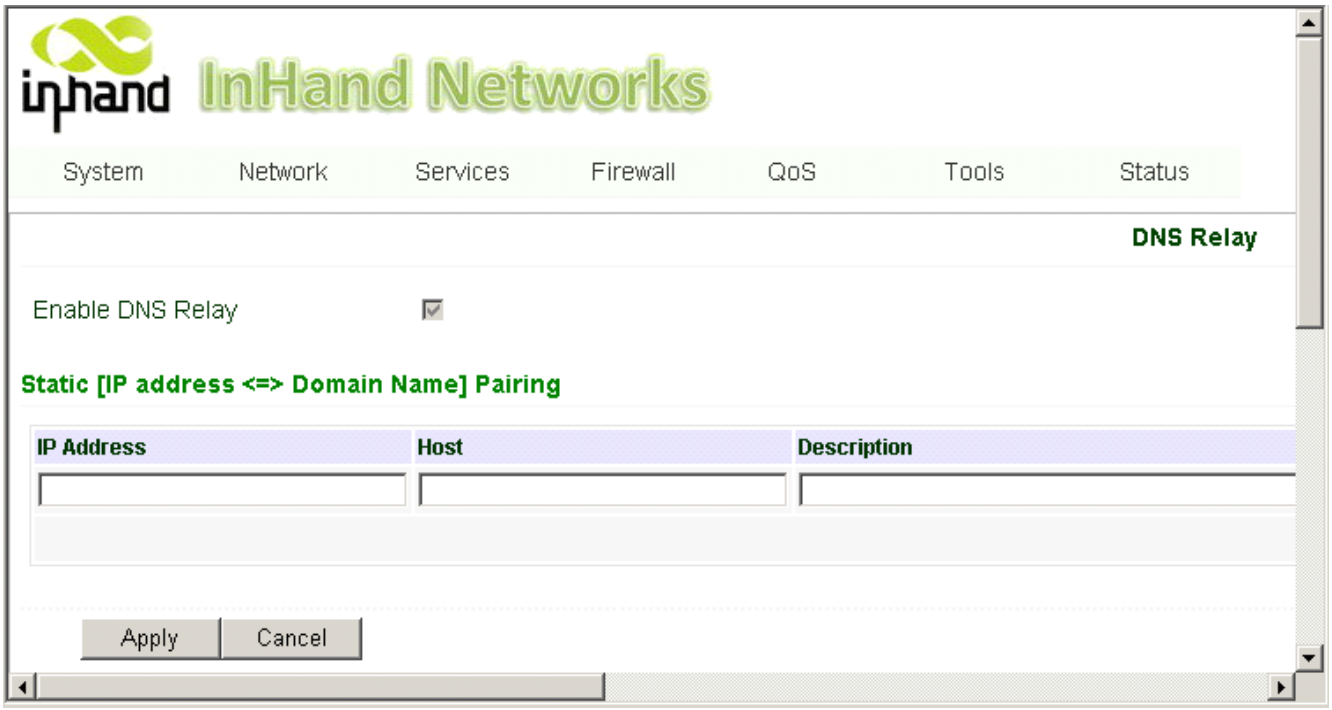
The page is described below:

Parameters	Description	Default
Enable DHCP	Check to enable DHCP.	Enable
IP Pool Starting Address	Set the starting IP address of DHCP pool.	192.168.2.2
IP Pool Ending Address	Set the ending IP address of DHCP pool.	192.168.2.100
Lease	Set the valid time lease of IP address obtained by DHCP	60 minutes
DNS	Set DNS Server	192.168.2.1
Windows Name Server (WINS)	Set the WINS binding.	0.0.0.0
Static DHCP		
MAC Address	Set the MAC address of a designated IP address.	00：00：00：00：00：00
IP address	Set the static IP address of the host.	192.168.2.2
Host	Set the hostname.	N/A

3.4.2 DNS Relay

DNS forwarding: DNS forwarding is open by default. You can set the specified [Domain Name <=> IP Address] to let IP address match with the domain name, thus allowing access to the appropriate IP through accessing to the domain name.

From navigation panel, select **Network >>DNS,** then enter "**DNS Relay**" page, as shown below.



The page description is shown below:

Parameters	Description	Default
IP Address	Map an IP to a hostname.	N/A
Host	Set the name of DNS entries.	N/A
Description	Describe DNS entry.	N/A

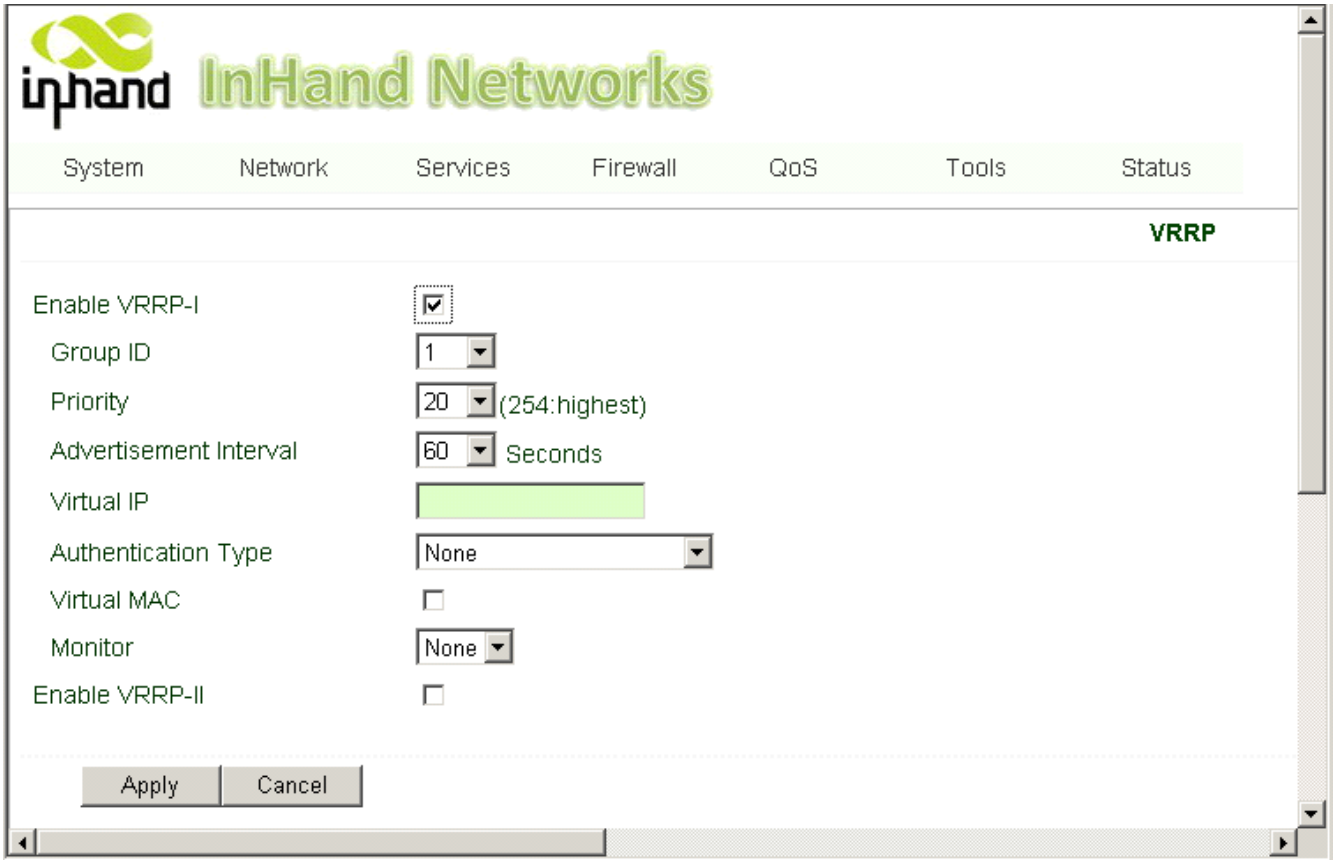
Attention

- When enabling DHCP, the DHCP relay is also enabled automatically. Relay cannot be disabled without disabling DHCP.
- While using dynamic DNS, the DNS relay service should be turned on.
- A maximum of twenty IP to domain-name pairs may be configured.

3.4.3 VRRP: Virtual Router Redundancy Protocol

VRRP is a protocol for allowing automatic failover and redundancy in routers. It creates a "virtual router," meaning multiple physical routers can be assigned to one gateway or one host. The main gateway controls the IP of the virtual gateway and routes packets to virtual IP addresses. If the main gateway drops, a dynamic failover process elects a new gateway. The IP address of the virtual gateway can be set as the default gateway for hosts, because it is the first hop. The benefit of using VRRP is serviceability. The network administrator can avoid the configuration of dynamic routing or routing discovery protocol on each host.

To enable VRRP, go to the navigation panel, select **Services >> VRRP,** then enter "**VRRP**" page, as shown below.



The page description is shown below:

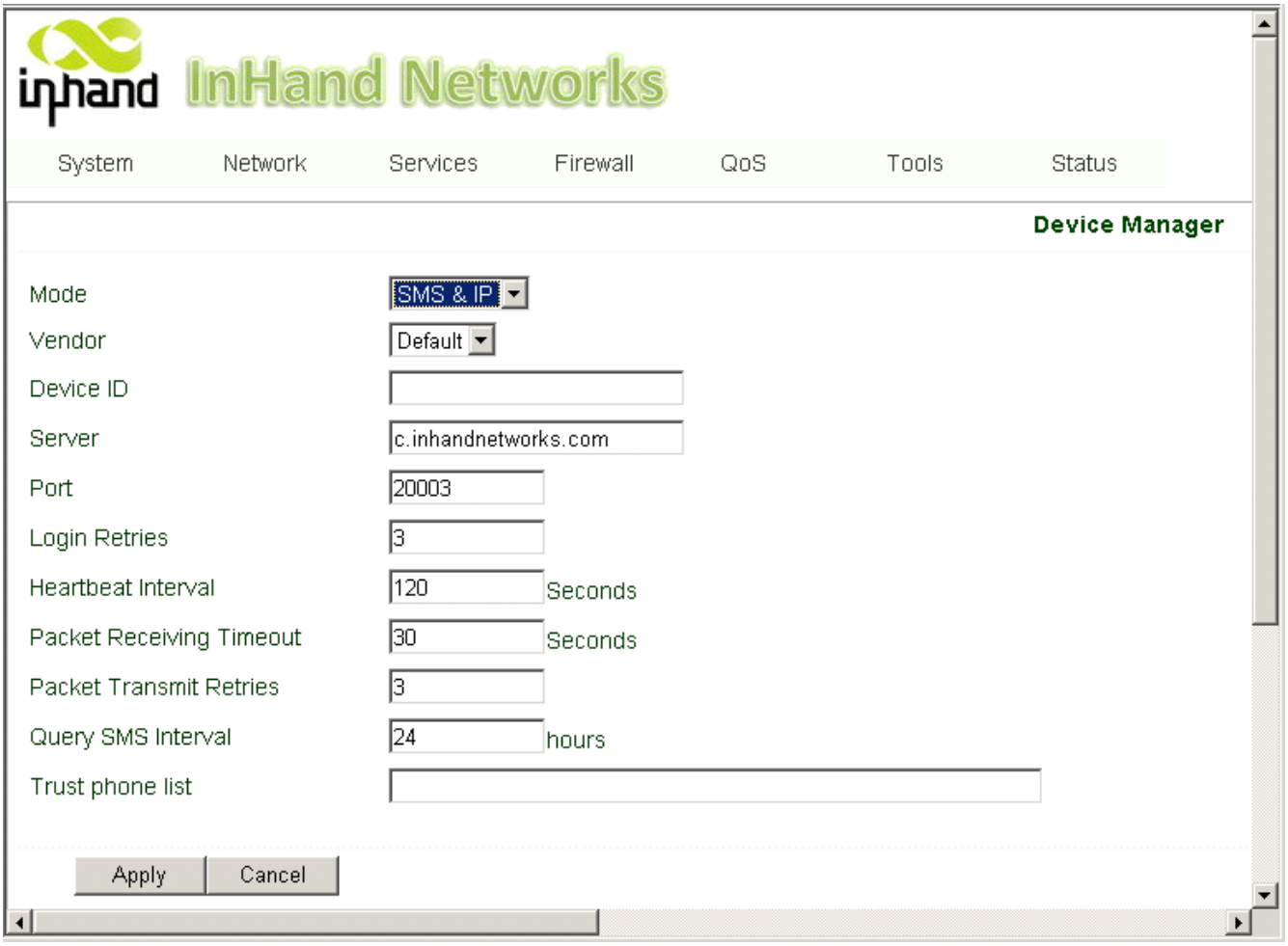
Parameters	Description	Default
Enable Group ID	Check to enable VRRP. Select a group id of gateway (range 1-255).	Disable 1
Priority Advertisement Interval	Select a priority for the gateway (range 1 - 254). Set an advertisement interval.	20 (bigger number stands for higher priority) 60 sec
Virtual IP Authentication Type	Set a Virtual IP address. Choose between "None" or Password type.	N/A None
Virtual MAC	Select to enable.	Disable
Monitor	Select WAN to start monitoring WAN interface traffic; select None do not monitor.	None

3.4.4 Device Manager

The device manager, or DM, is the InHand intelligent cloud platform for network management service.

You can remotely manage your IG601, find the current status and so on.

To configure the device manager, go to the navigation panel, select **Services >> Device Manager,** then enter "**Device Manager**" page, as shown below.



Terms are described below:

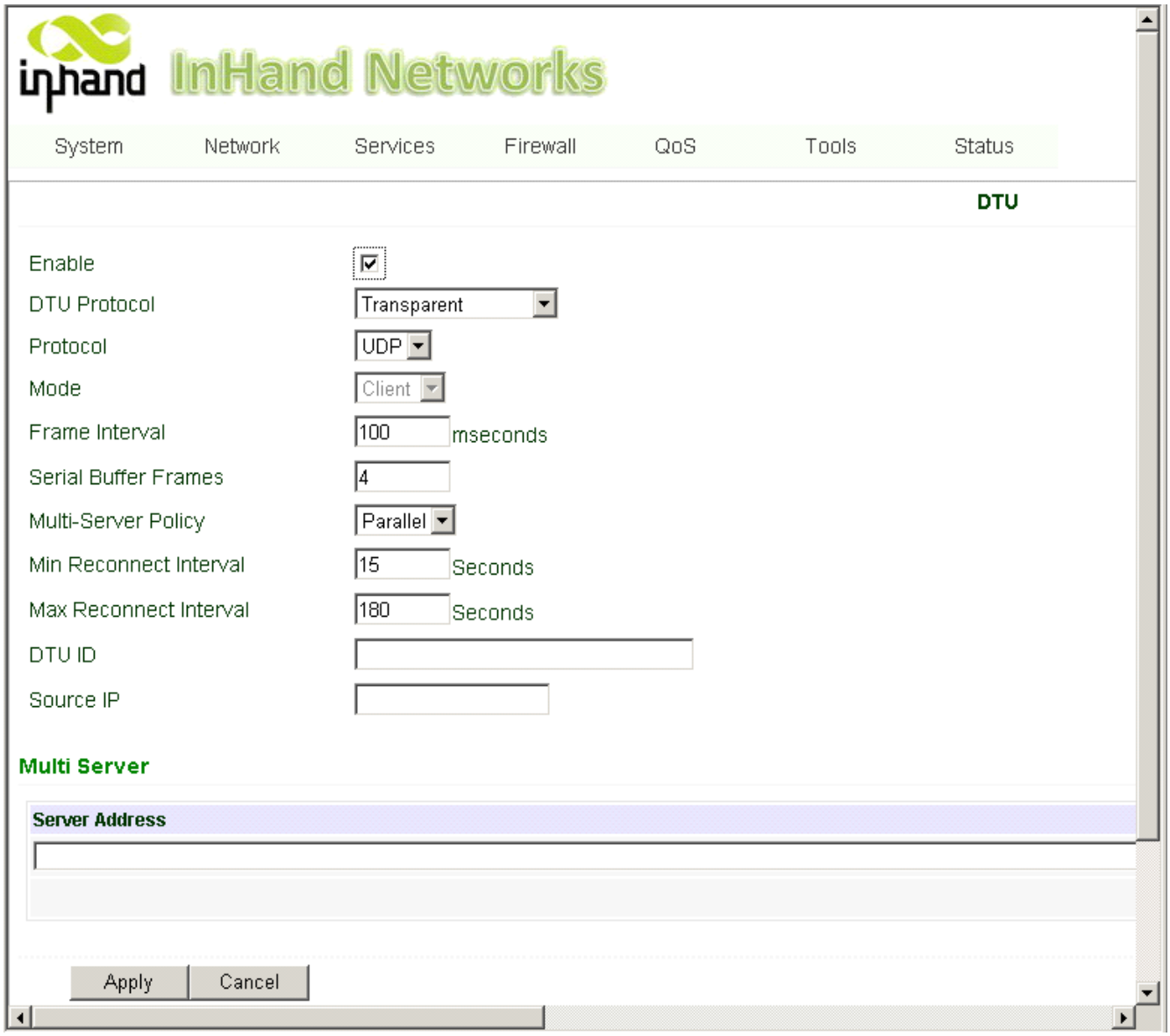
Parameters	Description	Default
Mode	SMS+IP is recommended.	Disable
Only SMS		
Query SMS Interval	Set how frequently to check SMS.	24 hours
Trust Phone List	Add trusted cell phone list, also known as a white list.	N/A
SMS+IP		
Vendor	Set a vendor name.	Default
Device ID	Set a device ID.	N/A
Server	Set a device manager server IP: g.inhandnetworks.com	c.inhandnetworks.com
Port	Set a port for device	20003

	manager.	
Login Retries	Set login retries	3
Heartbeat Interval	Set interval of heartbeats.	120 seconds
Packet Receiving Timeout	Set the timeout for dropped packets.	30 seconds
Packet Transmit Retries	Set packet transmit retries.	3
Query SMS Interval	Set how long to check SMS.	24 hours
Trust phone list	Set a trusted cell phone list.	

3.4.5 DTU

If you connect a serial device to IG601, you need enable the DTU converter. IG601 can support a multi-protocol uplink to allow conversion of serial data and IP data. Users must select the correct serial mode on the window "**Serial Port**" from the navigation tab "**System.**"

To enable the DTU, go into top navigation panel, select **Services >> DTU,** then enter "**DTU**" page, as shown below.



The page is described below:

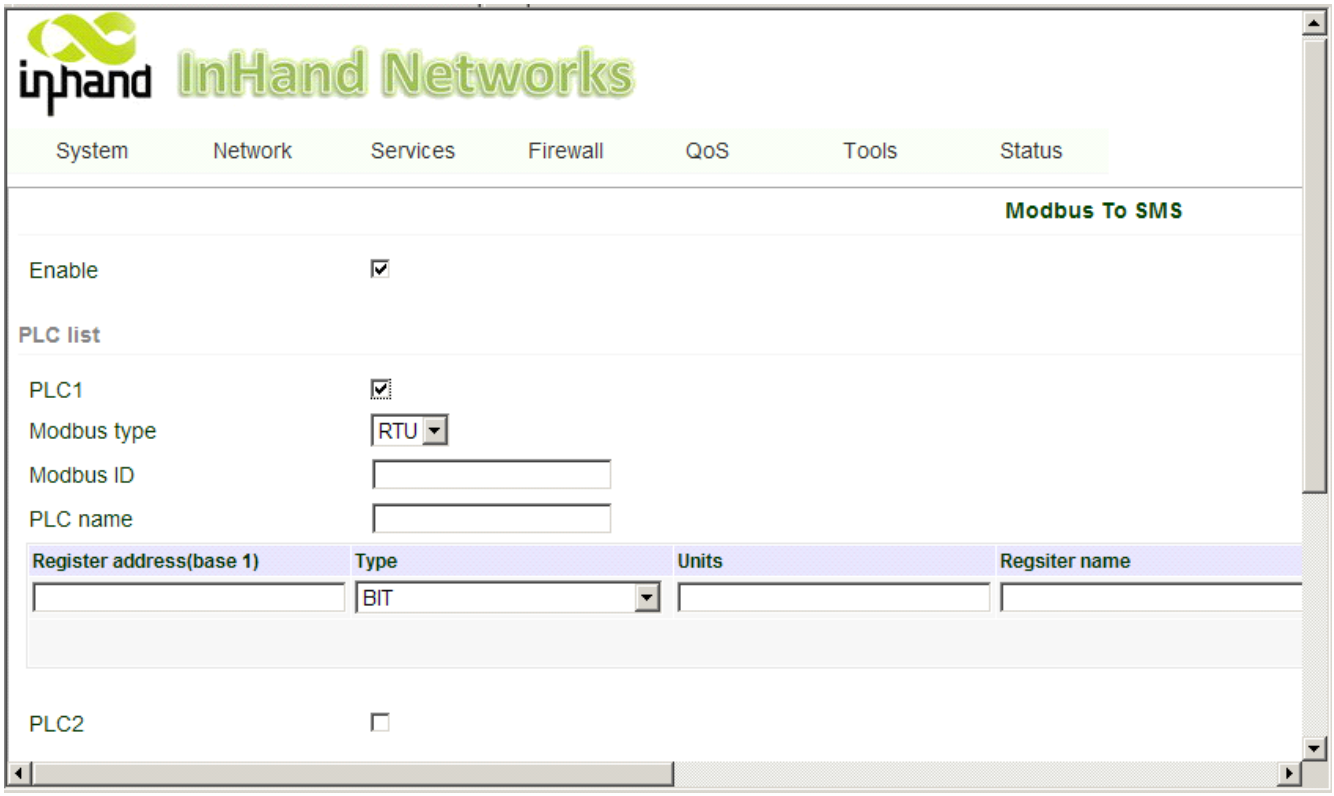
Parameters	Description	Default
Enable	Check to enable the DTU.	Disable
DTU Protocol	Set the DTU protocol. Please see more in related Quick Guide.	Transparent
Protocol	TCP and UDP are both options.	UDP
Mode	Set the DTU as a client or server.	Client
Frame Interval	Set the frame interval.	100 mseconds
Serial Buffer Frames	Set the number of serial buffer frames.	4
Multi-Server Policy	Choose either parallel or poll options.	Parallel
Min Reconnect interval	Set the minimum reconnect interval.	15s

Max Reconnect interval	Set the maximum reconnect interval.	180s
DTU ID	Set the ID of the DTU. It's only available when using DC protocol.	N/A
Source IP	Set the Source IP.	N/A

3.4.6 Modbus to SMS

InGateway inquires the variables status of the PLC every ten seconds and saves them into RAM. These variables will be the SMS response sent after a query. After receiving a control SMS, InGateway sends the control command to the PLC and waits for a response. The response is sent from the PLC and then InGateway sends the response to the user.

To enable SMS, find the navigation panel, select **Services** >> **Modbus to SMS** to enter into the "**Modbus to SMS**" page. After you add your PLC here, the daemon of IG601 periodically queries the PLC variables and cache to memory.



Follow the five steps below to configure the PLC parameters:

Step 1: Click 'Enable' in 'Service>>Modbus to SMS'

Step 2: Unfold configuration item of "PLC List" and click the PLC to be used, and configure one by one. 8 PLCs could be added on this page.

Step 3: Configure the specific parameters of PLC, each PLC can be added to 32 variables.

1) Set the modbus type. Only RTU is available on this model.
2) Configure the slave address of each PLC, namely the 'Modbus ID.' It may be assigned a value from 1 to 247.
3) Configure name of the PLC, using a maximal length of 16 bytes. It is important to name PLCs to avoid confusion in a large scale operation.
4) Enter the register address, or modbus variable address, in the first column. 0xxxxx is for discrete inputs. 1xxxxx is for a coil. 3xxxxx is for the incoming register, and 4xxxxx indicates a holding register.
5) The second column is the variable type, supporting BIT, WORD, DWORD, FLOAT, INT16, INT32 and INT64.
6) In the third column are the units of variable with maximum length of 8 bytes. This value will appear in SMS, and you can leave this field empty. The unit of BIT variables should be configured according to HH/LL format, HH represents the corresponding unit of "1," LL represents the corresponding unit of "0." The units of other types of variables will appear directly in SMS.
7) Enter the register name in the fourth column. This is simply the name of the variable with a maximum length of eight bytes. Users can define names for each variable and this field must be filled. The variable address will be replaced by variable name in SMS.

Instruction

- PLC ID in IG601 can not be repeated, neither can PLC names.
- Variable names can be repeated in one PLC variable list.
- Each PLC should be defined with ID, name and at least one variable.

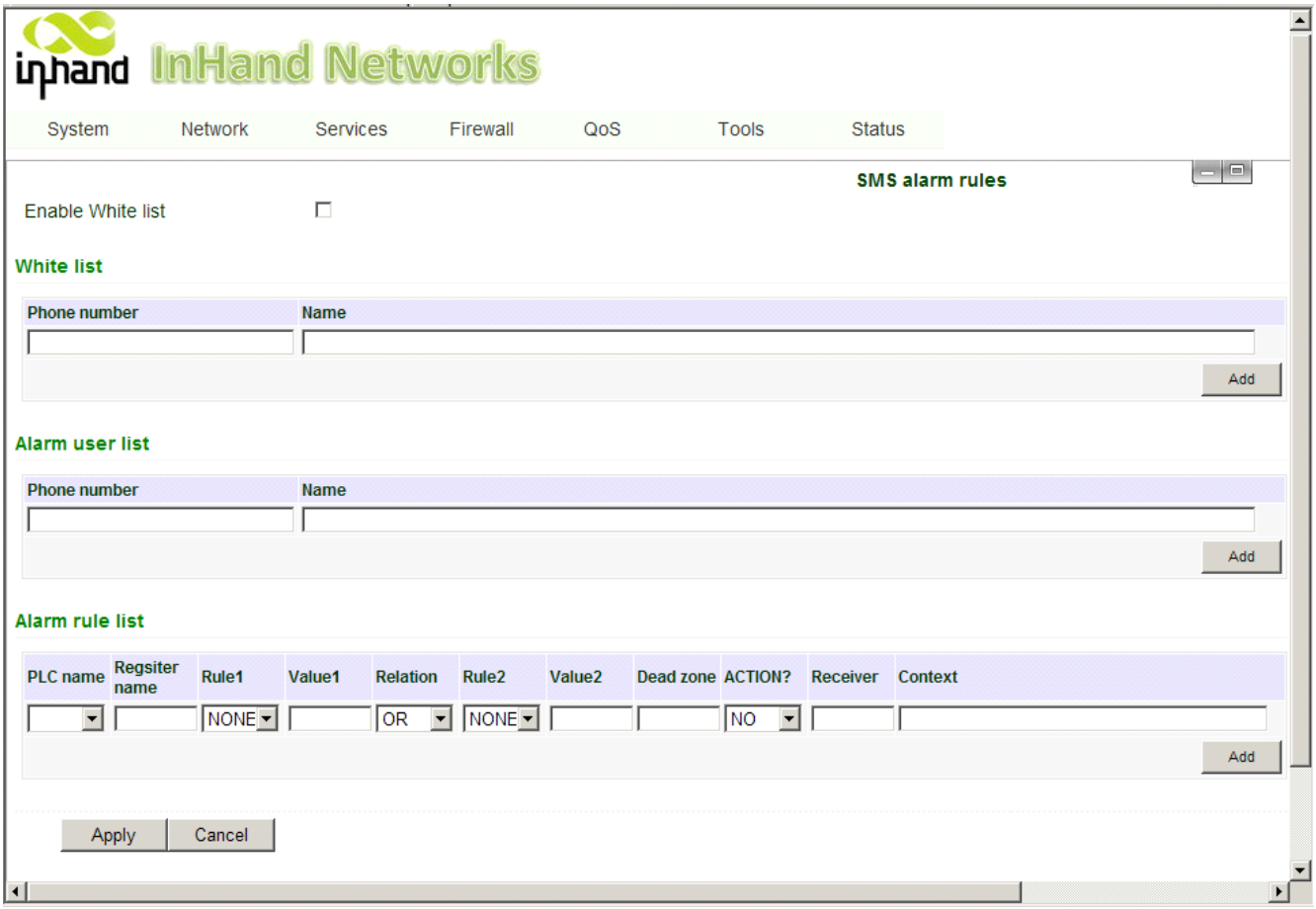
Step 4: Repeat step 3 and add more PLCs.

Step 5: Click <Apply> button, store and apply the new configuration.

3.4.7 SMS Alarm Rules

IG601 supports the configuration of up to one-hundred alarm rules, that when triggered send an alarm message to user's mobile phone. User can set the alarm rules, and adjust the SMS receiver in the alarm menu. The IG601 will collect different variables depending on the alarm rules set by the user. When a variable matches the criteria, IG601 will send an SMS alarm to all users on the "alarm user list," along with a message.

From the navigation panel, select **Services >> SMS Alarm Rules,** then enter the "**SMS Alarm Rules**" window, as shown below. After setting SMS, click the **<Apply>** to save and apply the configuration.



3.4.7.1 Enable White list

The IG601 is capable of receiving a control and inquiry SMS from any user. In order to improve security, users can enable the white list function. After the white list is set, the IG601 only processes SMS from users on the white list, meaning any other SMS will be dropped.

- Up to 10 users may be whitelisted.
- The first column is a telephone number, with a length ranging from 1 to 16 bytes, and is mandatory.
- The second column is the user name, with a length ranging from 0 to 16 bytes, and is optional.

After enabling the "Modbus to SMS" function, IG601 can identify two types of SMS commands sent

by the users on the white list. The IG601 performs an action corresponding to different commands and then sends a response to the SMS user.

Instruction

Users can send SMS to IG601 via mobile phone or SMS modem. Two types of SMS formats and response message are as follows:

The SMS to inquire state

Users can send the following SMS command to inquire the IG601 operating status and the register values of the PLC.

Request	Response Message	Description
GET	plc1 connected plc2 disconnected	Inquire about the name and status of all PLCs connected to the IG601.
GET plc1_name, plc2_name…	plc1 OUTPUT1=on OUTPUT2=off plc2 OUTPUT3=on OUTPUT4=on	Inquire about the PLC variables with names of plc1_name, plc2_name. The plcX_names are parameter. Users can query different PLC variables by modifying the plcX_name. Different PLCs are separated by a comma.
GET plc1_name register1 register2，plc2_name register3 register4,…	Plc1 register1=5 register2=6 plc2 register3=1.8 register4=2.2	This command finds the value of a variables under a PLC named plcX_name. The plcX_name and registerX are parameters. Users can find the name of corresponding variables by trying different perameter commands. By entering multiple registers, multiple variables can be found at the same time. Different PLCs are separated by comma.

Request	Response Message	Description
ALARM	Alarm total: 55, #53 date-time context1, #54 date-time	Find a count of historical alarm records and return

	context2, #55 date-time context3	the latest three historical alarms.
ALARM 2-3	Alarm total: 55, #2 date-time context1, #3 date-time context2, #4 date-time context3	Inquire about historical records within the appointed number range. It can request maximum of five historical records each time.
NETSATUS	Signal strength(dBm):xx, Network status: Registered to home network	Learn the network status.
MSGSTATUS	Received message: 10, Sent message: 15, Failed sent message: 0, Unauthorized message: 7	Inquire about the SMS statistics.
WHITELIST	WHITELIST ON|OFF	Inquire about the startup status of the white list.

The SMS to perform actions

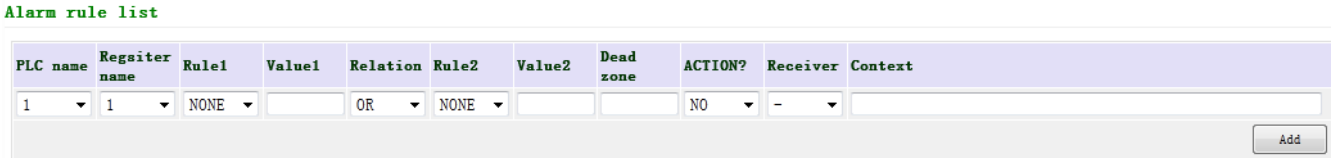
User can send the following SMS command to do the configuration via SMS.

Request	Response Message	Description
SET plc1_name register1=xxx register2=xxx，plc2_name register3=xxx register4=xxx…	Succeed: Set register1 to xxx set register2 to xxx set register3 to xxx set register4 to xxx	For a PLC named plc1_name, set the register value to xxx. The plcX_name and registerX are both parameters. User can set the corresponding variables by configuring these parameters in the command line. Such commands can set multiple variables synchronously. Different PLCs are separated by comma.
ALARM CLEAN ALL	Delete 1-55 alarm SUCCESS	Delete all the historical alarm records.
ALARM CLEAN xx-xx	Delete xx-xx alarm SUCCESS	Delete the historical records within the a range.
WHITELIST ON|OFF	WHITELIST ON|OFF	Start or stop using a white list.
ADD 13812345678	ADD 13812345678 OK	Add users to the alarm list.
DELETE 13812345678	DELETE 13812345678 OK	Delete users on an alarm list.

3.4.7.2 Alarm User List

- Up to ten alarm recipients can be added to the “alarm user list.”
- Mobile phone numbers are filled in the first column, and may range from 1 to 16 bytes long. This column must be filled, otherwise users cannot be added.
- User names are filled in the second column, and may range from 0 to 16 bytes long. This column may be left empty.
- Telephone numbers should be non-duplicated.

3.4.7.3 Alarm Rule List



In this section of interface, the technician will create an "alarm rule list.” Each line defines an alarm rule and a maximum of one-hundred alarm rules can be configured. The technician will match mathematical expressions and compare values to a variable in each rule. To set an alarm rule follow these steps:

- Select a PLC in the first column. Any PLC previously setup in the “Modbus to SMS” chapter of this manual will appear in a drop-down menu.
- Select a variable name in the second column, and the corresponding variable of the PLC will appear above it. The technician will compare values to this variable.
- Compare the variable to a value by selecting an operator in the third column. The available options are: NONE, >, >=, <, <=, = and !=.
- Define the first value in the fourth column. This value will be compared to the main variable. For example, temperature >= 200 means that when the temperature is greater than or equal to 200, an alarm will be sent.
- Define the relationship between the first expression and the second expression in the fifth column by selecting OR, AND or XOR.
- Select a second operator in the sixth column. The options that can be selected are: NONE, >, >=, <,

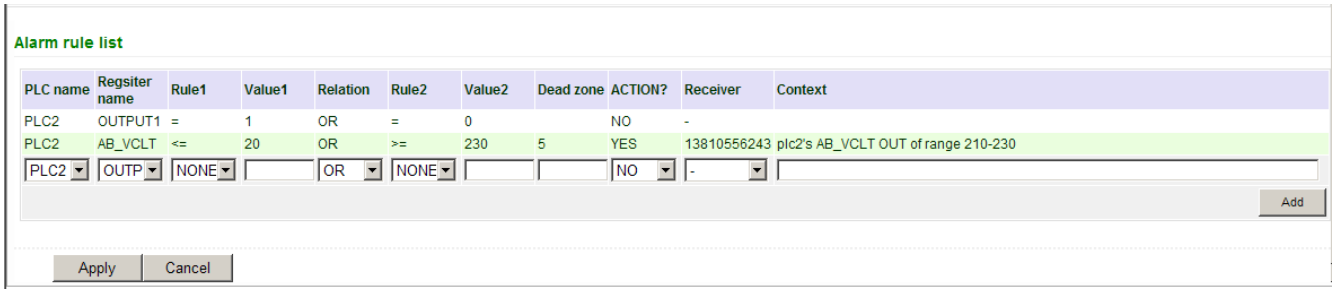
<=, = and !=.

- Define a second value in the seventh column.
- In the eighth column, the user must define a dead zone, which acts as a buffer. After the alarm is trigger, it will not be sent until the variable exceeds the dead zone value. It is only effective for numerical, non bit-wise values. Set the value to zero to eliminate the dead zone.
- In the ninth column titled "**ACTION?,**" users may select "**YES**" to enable user-defined alarm message, user need define the alarm message on "Context" in the eleventh column. Otherwise, the default alarm message will be sent. The maximum length for a short message is 140 bytes.
- The mobile phone number of a recipient is input in the tenth column.
- A user-defined alarm message may be set in the eleventh column. When triggered, this message will be sent in the form of an SMS.

The alarm SMS are divided into two types:

- If the selection for "ACTION?" in the ninth column is NO, the system will send the automatically generated defaulted alarm short message. The message will be defined by the variable, for example: "Alarm plc2 OUPUT=on," or "Alarm plc AB_VOLT=238V."
- If the selection of "ACTION?" is YES, the system will send a user-defined alarm.

Below is an example of an alarm rule:



Instruction

The first rule states that when the OUTPUT1 of plc2 changes from 1 to 0 or from 0 to 1, trigger the alarm and send the alarm SMS to all users in the "alarm user list."

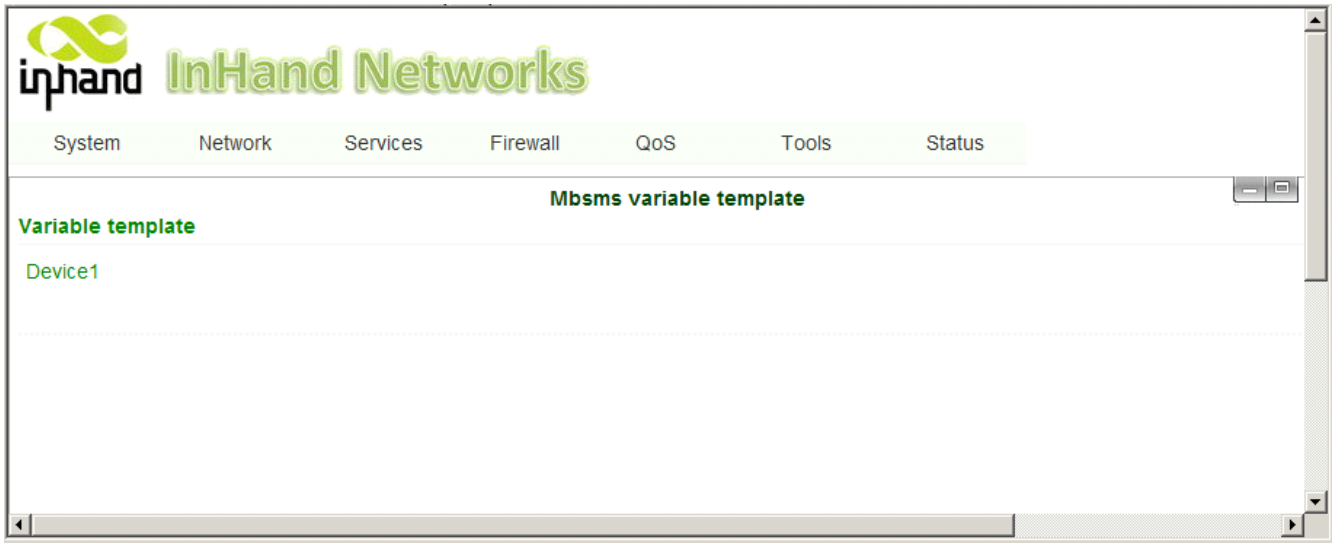
The second rule states that when the variable value of AB_VOLT in plc2 is less than or equal to 20 or greater than or equal to 230, trigger the alarm and send the user-define SMS to the user '13810556243.' In other words, when AB_VOLT is between 20 and 230, plc2 is

in normal operating conditions.

3.4.8 Mbsms Variable Template

Users can download a PLC variable template file which you might have added in section 3.3 “Modbus to SMS.” A template file is composed of all the variables in a PLC, and the IG601 supports up to eight templates.

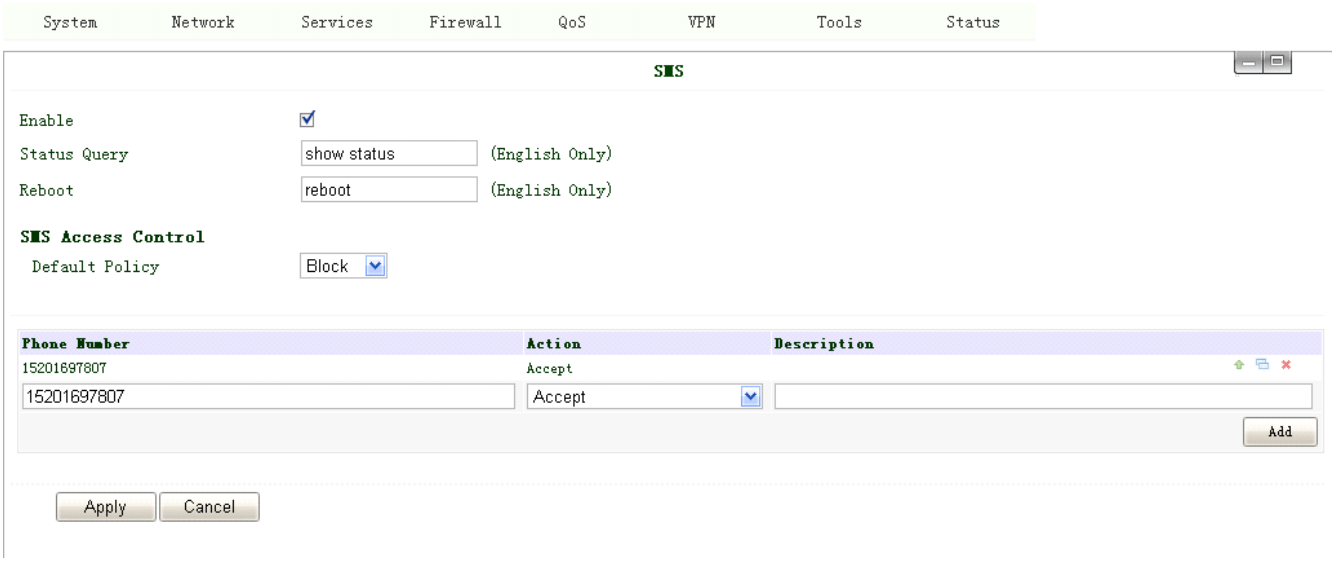
To configure the Mbsms template, go into the navigation panel, select **Services >> Mbsms Variable Template,** then enter “**Variable Template**” page, which is shown below.



3.4.9 SMS

User can do a status check and reboot the IG601 through SMS. After setting a user-defined message in the SMS config window, users can see the device's status or reboot the device. Statistics like signal strength, IP address, and uptime, among others, may be used to analyze the device.

To configure SMS, find the navigation panel, select **Services >> SMS,** then enter “**SMS**” page, as shown below.



The page description is shown below:

Parameters	Description	Default
Enable	Click to enable SMS.	Disable
Status Query	This is user defined. After configuration, the user sends the predetermined message to IG601, which will send status information to user's mobile phone. The information include :Host: (SN); Uptime: (the uptime of router for this time of reboot); State: (Online/Offline); LAN: (Up) (LAN IP)	N/A
Reboot	This is user defined as well. After configuration, the user will send a user-defined message to the IG601 which will then restart.	N/A
Default Policy	This accepts by default. If the mobile phone number is empty, the IG601 will execute the SMS command from any mobile phone number. If a phone number is entered into the field, the IG601 will execute SMS commands from the configured mobile phone number.	Accept

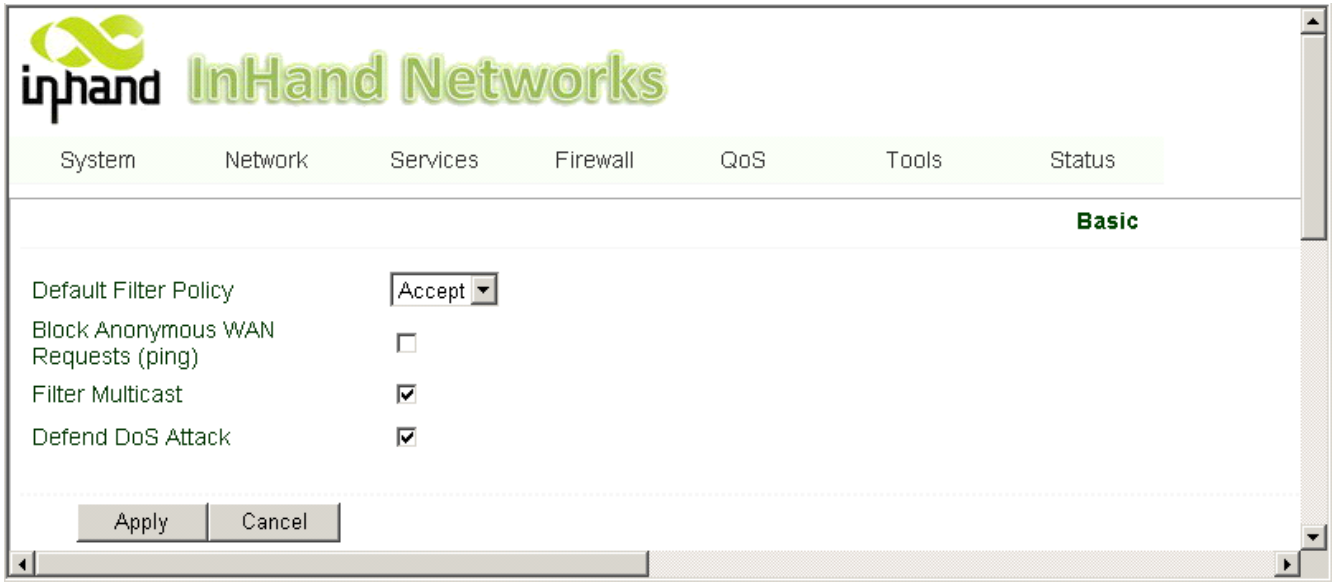
3.5 Firewall

3.5.1 Basic

A firewall is necessary for blocking out malicious packets from the internet. On today's internet, security is more important than ever, which is why the IG601 is well equipped to protecting the local network and provide a security barrier from external threats.

To configure the firewall, go to the navigation panel, select **Firewall >> Basic,** then enter the "**Basic**"

config page, as shown below.



The page description is shown below:

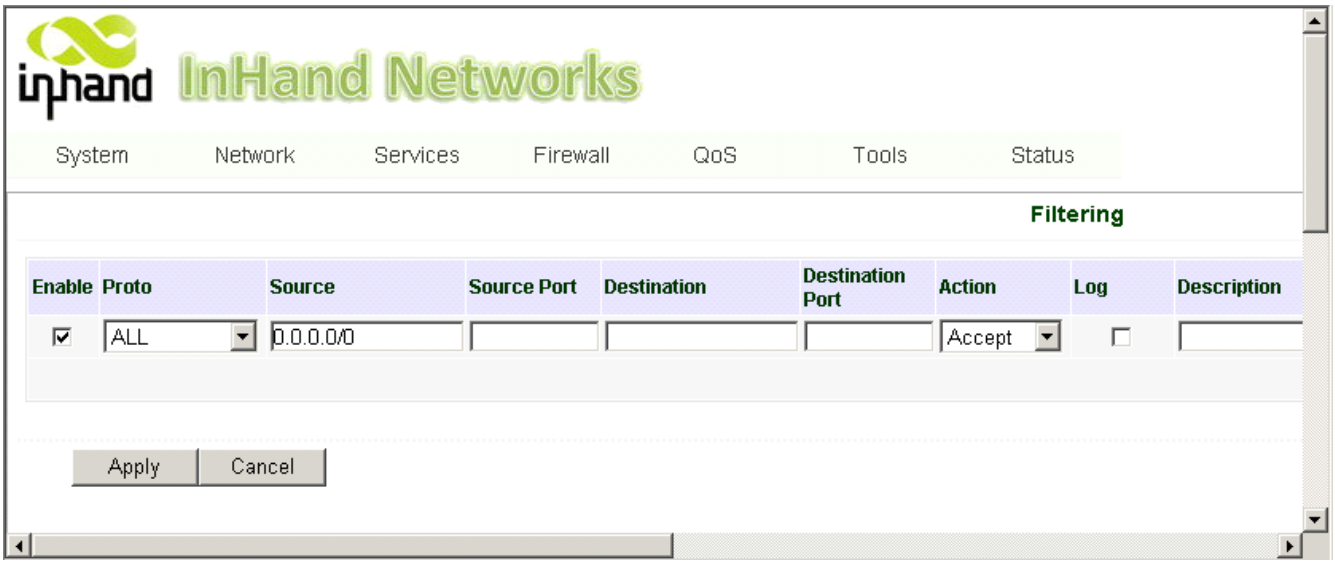
Parameters	Description	Default
Default Filter Policy	Choose to either "Accept" or "Block" filtering.	Accept
Block Anonymous WAN Request (ping)	Check to deny anonymous ICMP ping requests.	Disable
Filter Multicast	Check to filter multicast packets.	Enable
Defend DoS Attack	Select to enable DoS attack prevention.	Enable

3.5.2 Filtering

Access control has the following functions:

- Prevent unwanted users from accessing network resources.
- Permitting staff to access network resources.
- Preventing staff from accessing the wrong network resources.

To enable Access Control From the navigation panel, select **Firewall >> Filtering,** then enter "**Filtering**" page, as shown below.



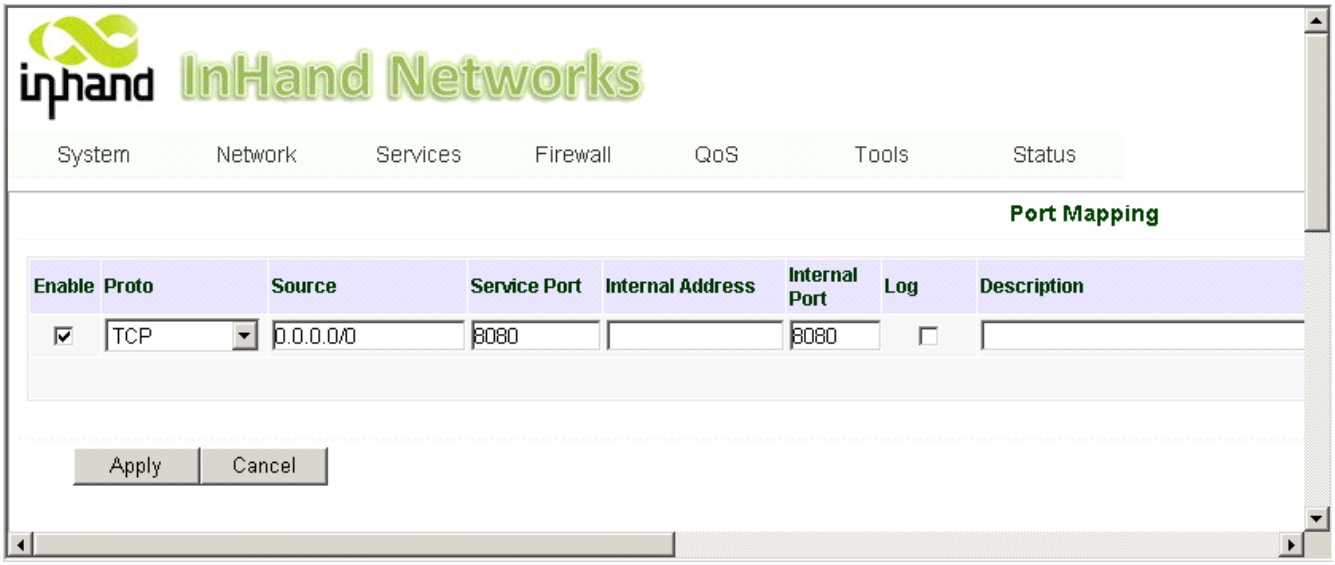
Page description is shown below:

Parameters	Description	Default
Enable	Check to enable filtering.	Enable
Protocol	The available options are: TCP, UDP, ICMP, and all.	All
Source IP address	Set the source IP address.	0.0.0.0/0
Source Port	Set the source port.	N/A
Destination IP	Set the destination IP address.	N/A
Destination Port	Set the destination port.	N/A
Action	Select either accept or block.	Accept
Log	log can print the access IP address	Disable
Description	Describe your configuration.	N/A

3.5.3 Port Mapping

The IG601 support Network Address and Port Translation. It allows remote computers (for example, computers on the Internet) to connect to the local device that linked to LAN interface.

To configure port mapping, go into the navigation panel, select **Firewall >> Port Mapping,** then enter "**Port Mapping**" page, as shown below.



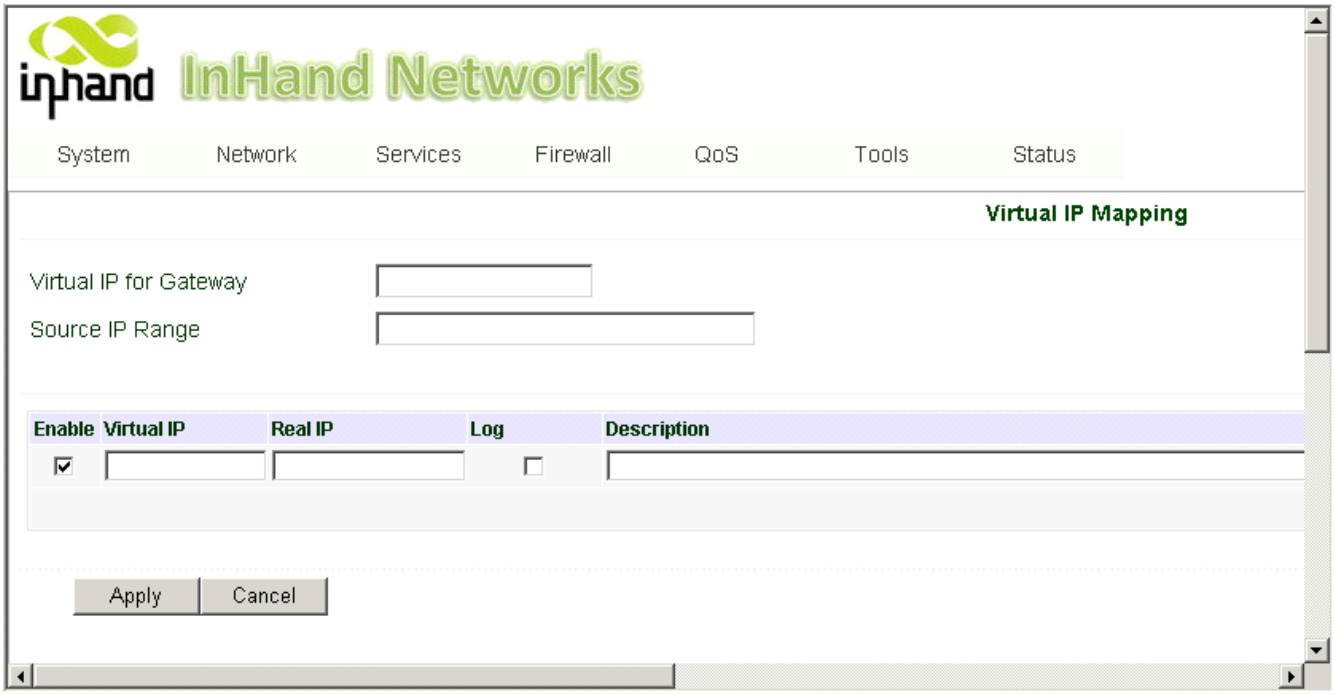
Page description is shown below:

Parameters	Description	Default
Enable	Check to enable port mapping.	Enable
Protocol	Select either TCP or UDP.	TCP
Source	Set an external source IP.	0.0.0.0/0
Service Port	Set the external port of service.	8080
Internal Address	Set the internal IP for mapping.	Blank
Internal Port	Set the mapping port.	8080
Log	Click to enable a log about port mapping.	Disable
Description	Write a description to avoid future confusion.	Blank

3.5.4 Virtual IP Mapping

After a PC in LAN has been assigned a virtual IP, external hosts can access it via a virtual IP. The functions usually work with VPN.

To enable virtual IP mapping, go into the navigation panel, select **Firewall >> Virtual IP Mapping,** then enter the "**Virtual IP Mapping**" page, as shown below.



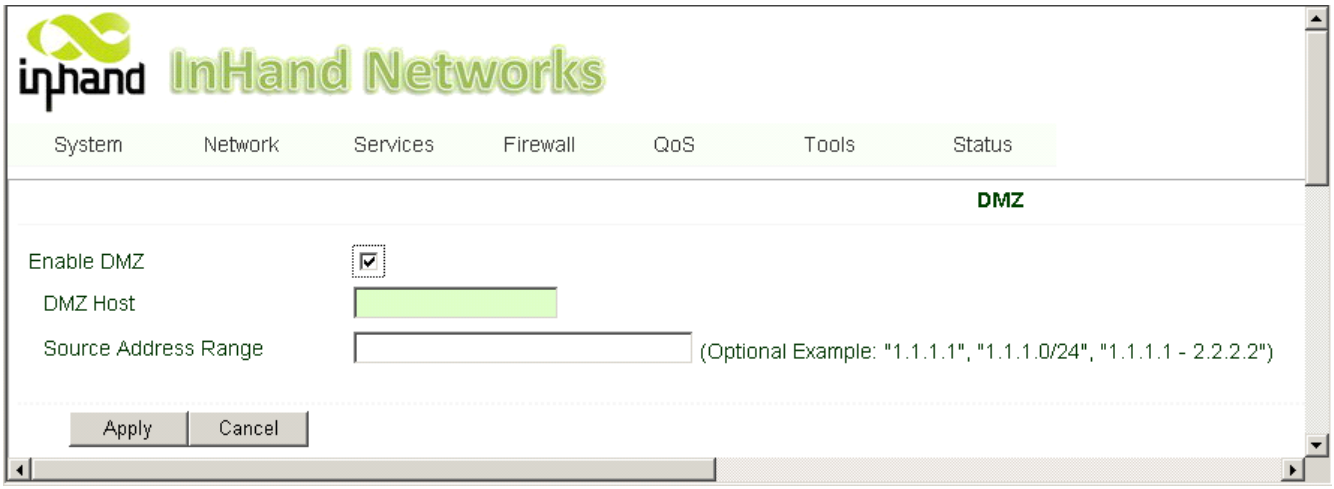
Page description is shown below:

Parameters	Description	Default
Virtual IP for Gateway	Set a virtual IP for the InGateway.	Blank
Source IP Range	Set range of the external source IP addresses.	Blank
Virtual IP	Set an external virtual IP.	Blank
Real IP	Set a real IP.	Blank
Log	Enable a log of virtual IP events.	Disable
Description	Describe this configuration.	Blank

3.5.5 DMZ (All Port Mapping)

DMZ is like a virtual server, the all port of router map to the DMZ host

From the navigation panel, select **Firewall >> DMZ,** then enter "**DMZ**" page, as shown below.



The page description is shown below:

Parameters	Description	Default
Enable DMZ	Check to enable the DMZ.	Disabled
DMZ Host	Set the host IP of a DMZ.	Blank
Source Address Range	Set a range of restricted source IP addresses.	Blank

Attention

The IG601's management port should never be mapped to a DMZ.

3.5.6 MAC-IP Bundling

When a firewall denies all access to the external network, only a PC with MAC-IP bundling can access the internet.

From the navigation panel, select **Firewall >> MAC-IP Bundling,** then enter the "**MAC-IP Bundling**" page, as shown below.

The page description is shown below:

Parameters	Description	Default
MAC Address	Set the bundling PC's mac address.	00:00:00:00:00:00
IP Address	Set the bundling PC's IP address.	192.168.2.2
Description	Describe this configuration.	Blank

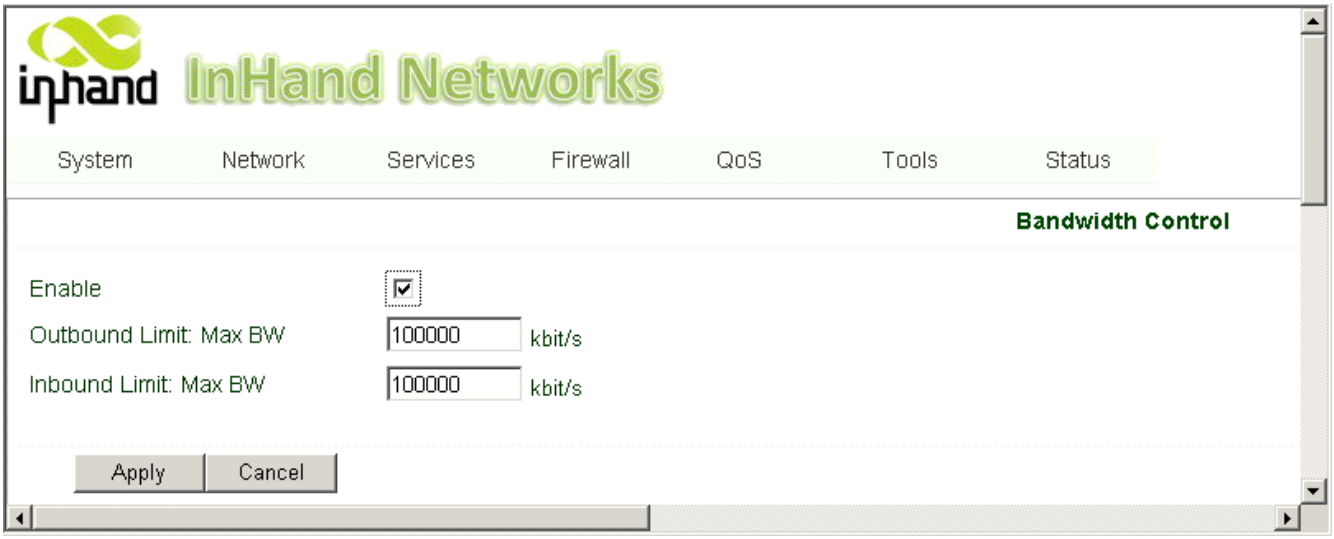
3.6 QoS

This chapter covers QoS, or Quality of Service. QoS is a set of services that ensures bandwidth availability for sensitive applications. These services includes bandwidth control and IP bandwidth limits.

3.6.1 Bandwidth Control

Bandwidth control set a limit on the upload and dowload speeds when accessing external networks.

To configure bandwidth control, go into the navigation panel, select **QoS >> Bandwidth Control,** then enter "**Bandwidth Control**" page, as shown below.



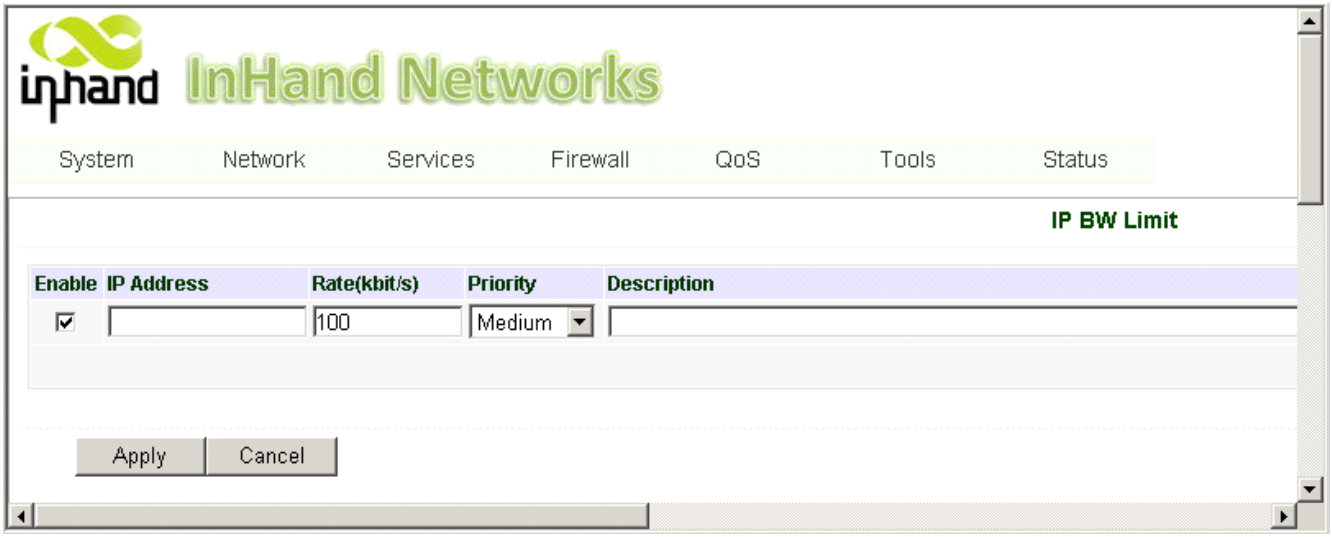
The page description is shown below:

Parameters	Description	Default
Enable	Check to enable.	Disable
Outbound Limit Max Bandwidth	Set the maximum upload rate.	100000kbit/s
Inbound Limit Max Bandwidth	Set the download bandwidth limit.	100000kbit/s

3.6.2 IP Bandwidth Limit

Technicians may limit the bandwidth on individual hosts and devices by setting IP based bandwidth limits.

To configure the IP bandwidth limit, go to the navigation panel, select **Firewall >> IP BW Limit,** and then enter the "**IP BW Limit**" page, as shown below.



The page description is shown below:

Parameters	Description	Default
Enable	Check to enable an IP bandwidth limiter.	Enable
IP Address	Set the IP address to be limited.	N/A
Rate(kbit/s)	Set the bandwidth limit or rate.	100kbit/s
Priority	Set the priority.	Medium
Description	Describe the configuration.	N/A

3.7 Tools

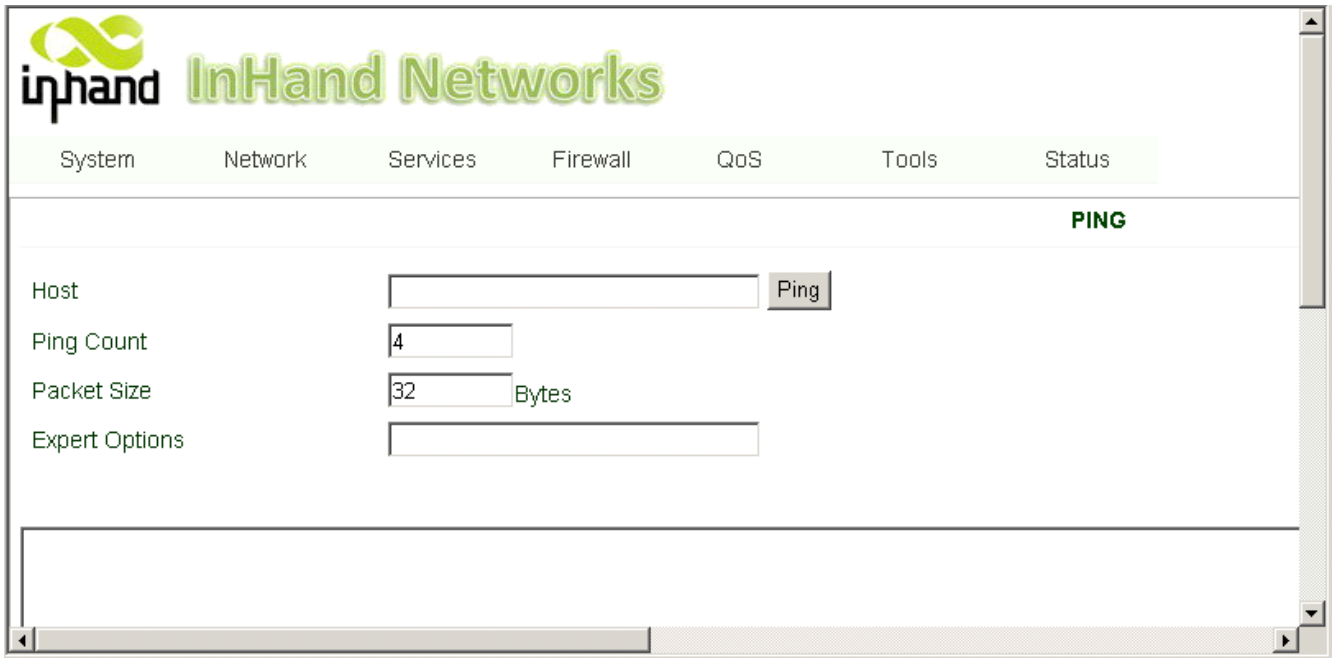
The IG601 comes with several tools to help admins diagnose network problems, including:

- Ping
- Trace route
- Link Speed Test

3.7.1 Ping

Ping a tool many technicians are familiar with. It simply sends ICMP packets across the network to a remote host, and then retransmits an ICMP packet back to the original sender.

To do a ping, enter the navigation panel, select **Tools>>Ping,** then enter the "**Ping**" page, as shown below.



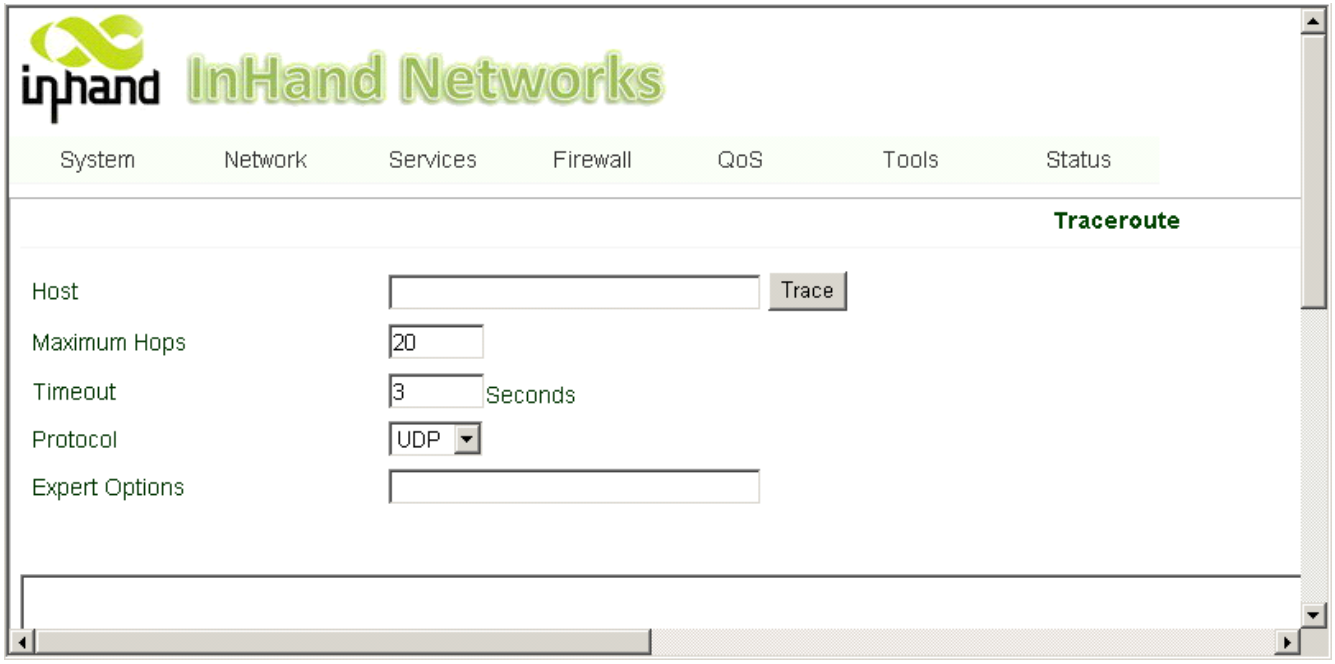
Page description is shown below:

Parameters	Description	Default
Host	Destination IP for the ping.	N/A
Ping Count	Number of pings sent.	4 times
Packet Size	The size of the ping packet sent. 32B is recommended.	32 Bytes
Expert Options	Advanced parameters	N/A

3.7.2 Trace Route

The trace route tool sends an ICMP or UDP packet to a remote host. Each time the packet is routed onto a different network, that router will return a response. Trace route allows network engineers to diagnose routing problems.

To preform a trace route, go to the navigation panel, select **Tools>>Traceroute,** then scroll down to the "**Traceroute**" page, as shown below.



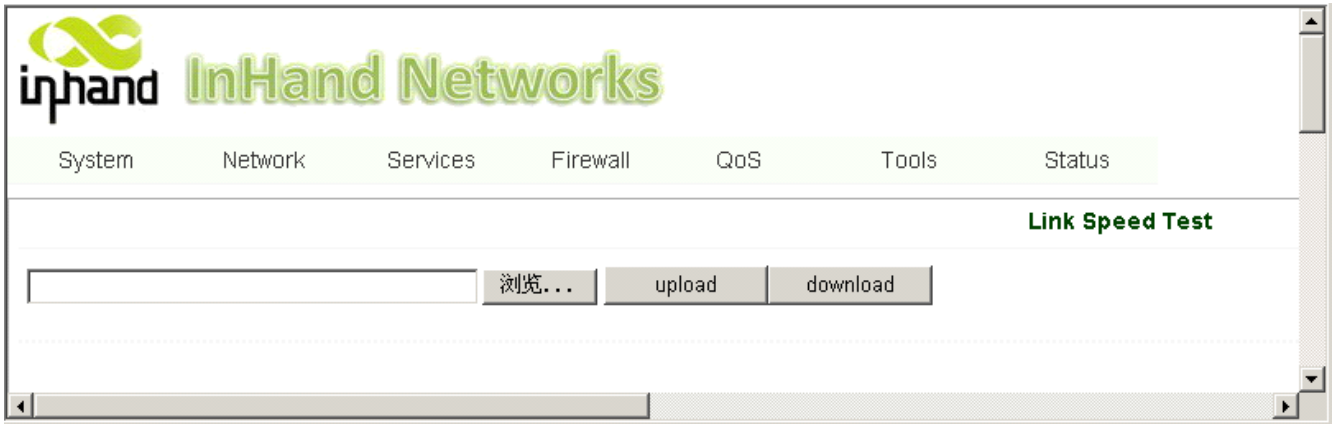
The page description is shown below:

Parameters	Description	Default
Host	The destination for trace route.	N/A
Max Hops	Set the maximum number of hops.	20
Time Out	Set the timeout for dropped packets.	3 sec
Protocol	Choose between ICMP and UDP protocol. ICMP may be blocked on some networks.	UDP
Expert Options	Advanced parameters	N/A

3.7.3 Link Speed Test

The IG601 uses a simple upload and download to test the link speed.

To start the speed test, enter the navigation panel, select **Tools>>Link Speed Test,** then enter "**Link Speed Test**" page, as shown below.



3.8 Status

The status chapter covers the following:

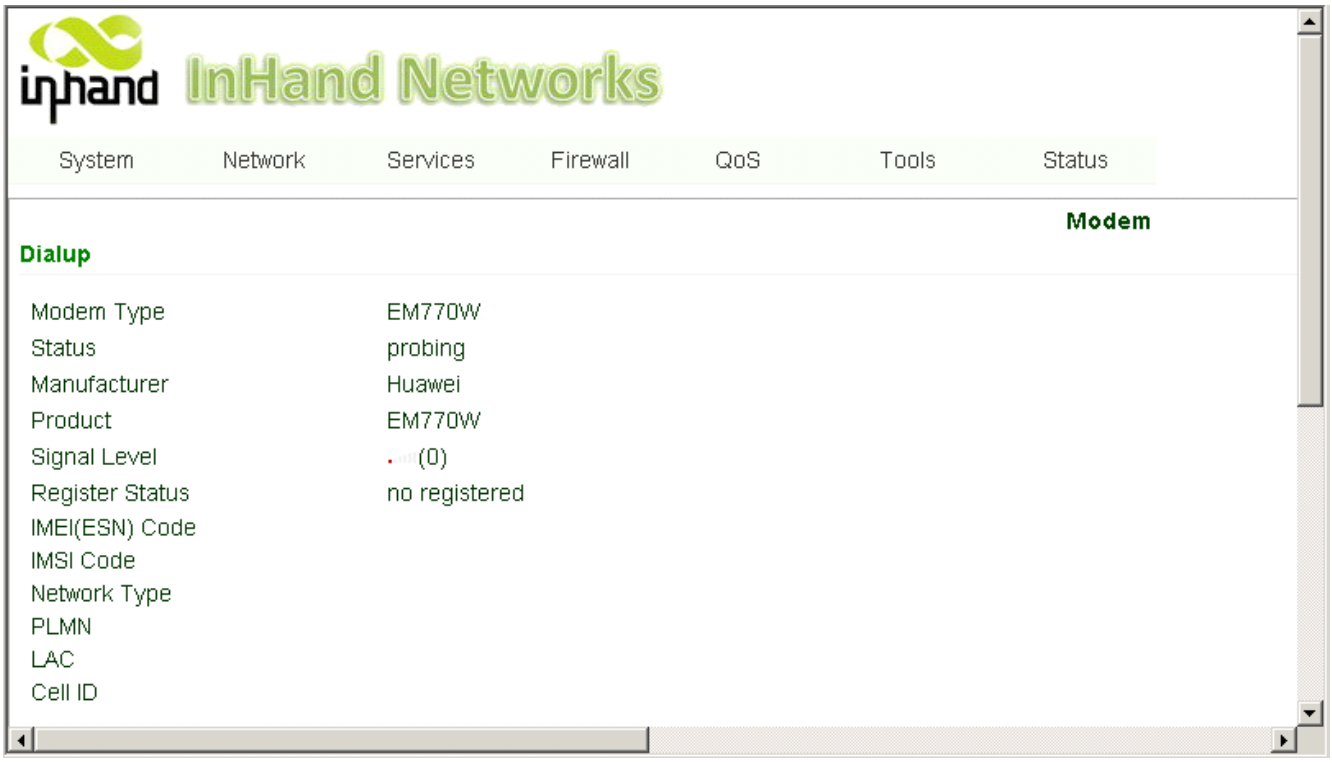
- System
- Modem
- Network Connections
- Routing Table
- Device List
- ModbusPLC
- Event Logs

3.8.1 System

From navigation panel, select **Status >> System,** then enter the "**System**" page, as shown below. This page displays system statistics, including Name, Model, Current Version, Gateway Time, PC Time, UP Time, CPU Load, Memory Consumption, etc. Technicians may click the <**Sync Time**> button to synchronize the gateway with the system time of the host, as covered in the set-up chapter.

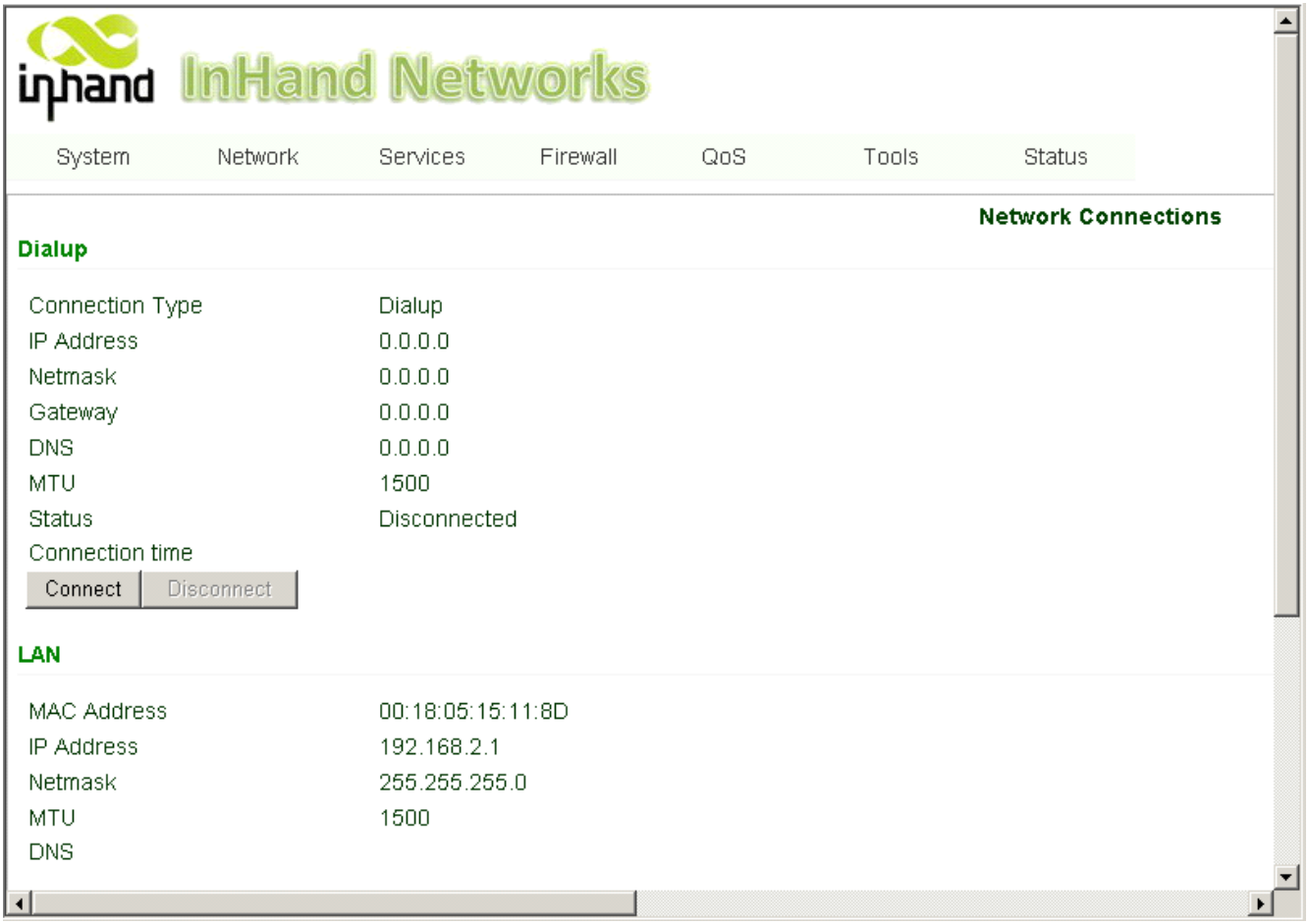
3.8.2 Modem

From navigation panel, select **Status** >> **Modem,** then enter "**Modem**" page, as shown below. This page shows Modem status, including Signal Level, Register status, etc.



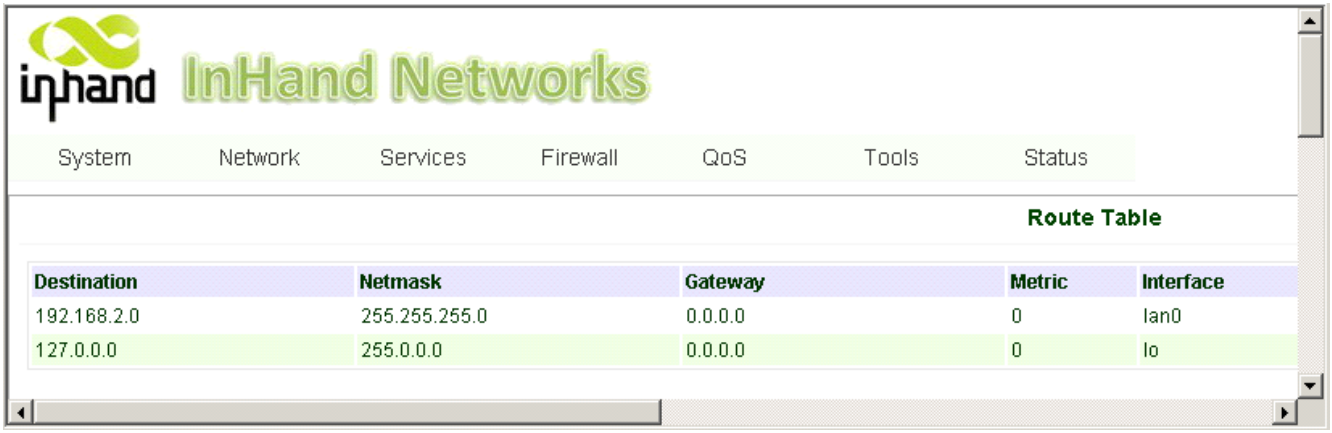
3.8.3 Network Connections

From navigation panel, select **Status >> Network Connections,** then enter "**Network Connections**" page, as shown below. This page shows the connection status of Dialup and LAN.



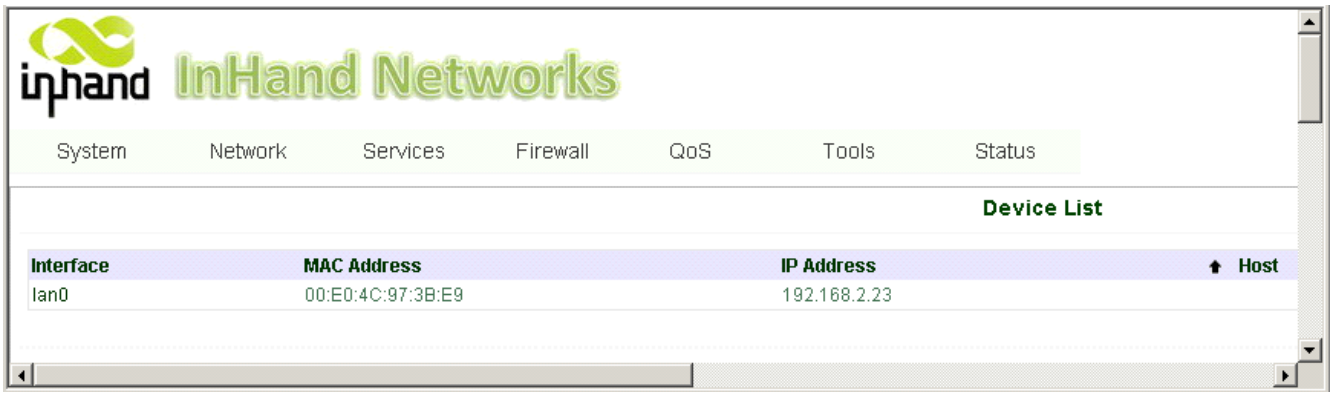
3.8.4 Route Table

From navigation panel, select **Status >> Route Table,** then enter "**Route Table**" page, as shown below. This page shows the route table of IG601.



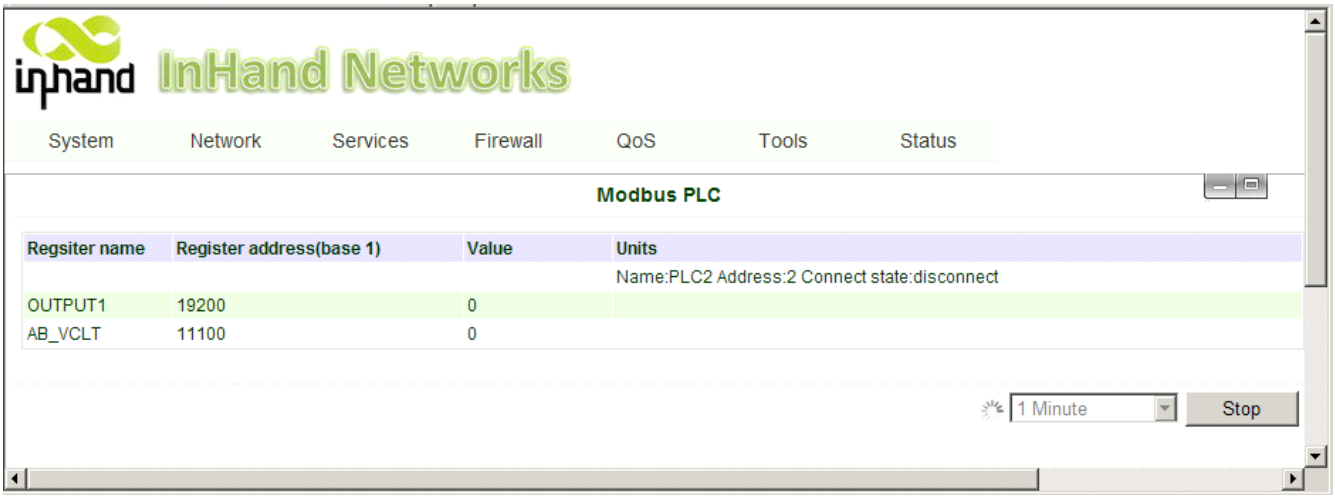
3.8.5 Device List

From navigation panel, select **Status** >> **Device List,** then enter "**Device List**" page, as shown below. This page shows the device link of IG601.



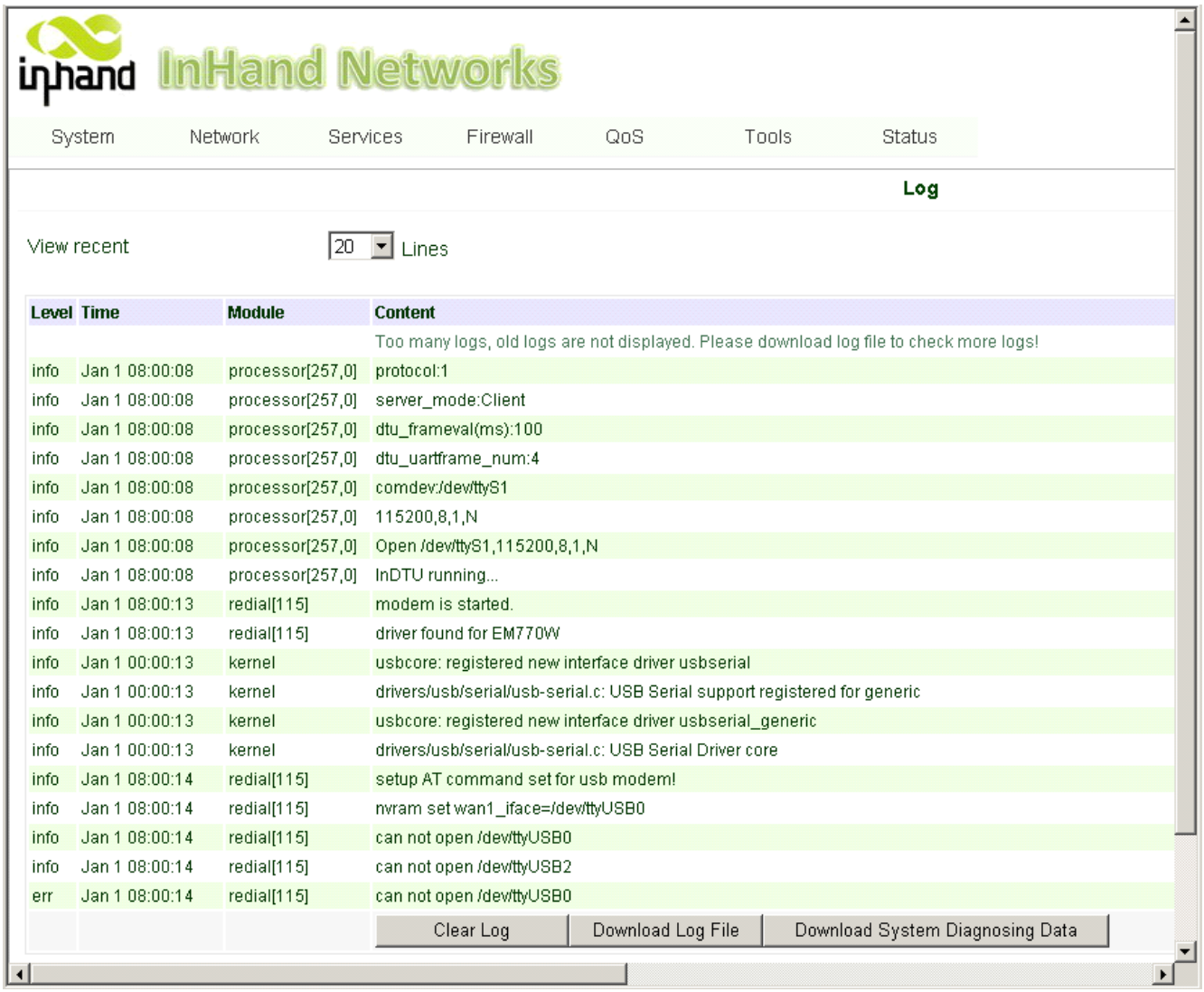
3.8.6 Modbus PLC

From navigation panel, select **Status** >> **Modbus PLC,** then enter "**Modbus PLC**" page, as shown below. This page shows the parameters of Modbus PLC linked with IG601.



3.8.7 Log

From navigation panel, select **Status** >> **Log,** then enter "**Log**" page, as shown below. This page show system log, including Download Log File.


InHand Networks
System
Network
Services
Firewall
QoS
Tools
Status
Log
View recent
20
Lines
Level
Time
Module
Content
Too many logs, old logs are not displayed. Please download log file to check more logs!
info Jan 1 08:00:08 processor[257,0] protocol:1
info Jan 1 08:00:08 processor[257,0] server_mode:Client
info Jan 1 08:00:08 processor[257,0] dtu_frameval(ms):100
info Jan 1 08:00:08 processor[257,0] dtu_uartframe_num:4
info Jan 1 08:00:08 processor[257,0] comdev:/dev/ttyS1
info Jan 1 08:00:08 processor[257,0] 115200,8,1,N
info Jan 1 08:00:08 processor[257,0] Open /dev/ttyS1,115200,8,1,N
info Jan 1 08:00:08 processor[257,0] InDTU running...
info Jan 1 08:00:13 redial[115] modem is started.
info Jan 1 08:00:13 redial[115] driver found for EM770W
info Jan 1 00:00:13 kernel usbcore: registered new interface driver usbserial
info Jan 1 00:00:13 kernel drivers/usb/serial/usb-serial.c: USB Serial support registered for generic
info Jan 1 00:00:13 kernel usbcore: registered new interface driver usbserial_generic
info Jan 1 00:00:13 kernel drivers/usb/serial/usb-serial.c: USB Serial Driver core
info Jan 1 08:00:14 redial[115] setup AT command set for usb modem!
info Jan 1 08:00:14 redial[115] nvram set wan1_iface=/dev/ttyUSB0
info Jan 1 08:00:14 redial[115] can not open /dev/ttyUSB0
info Jan 1 08:00:14 redial[115] can not open /dev/ttyUSB2
err Jan 1 08:00:14 redial[115] can not open /dev/ttyUSB0
Clear Log
Download Log File
Download System Diagnosing Data

Installation Guide

Precautions:

- Power Requirments: 12/24VDC, Please note that the power supply voltage level.
- Environmental Requirement: Working: 0~70℃（50~70℃ permission）, Storage: -40 ~ 85℃, Humidity: 5 ~ 90% relative humidity (noncondensing)
- Avoid direct sunlight, away from heat sources or areas with strong electromagnetic interference.
- InGateway need to be installed in an industrial DIN Rail.
- Please check whether installed the needed cables and connectors.

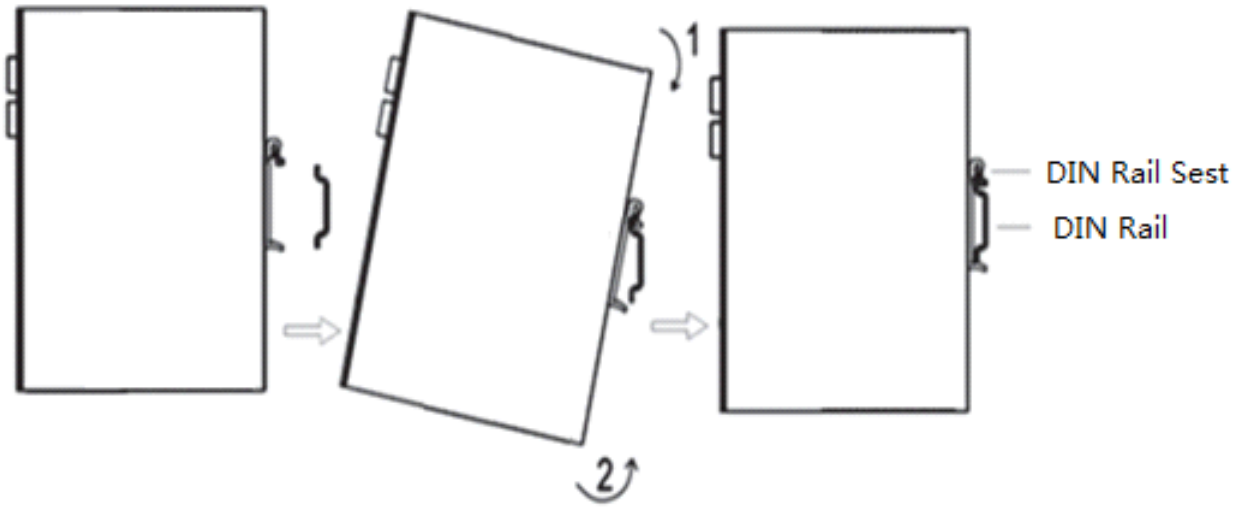
4.1 DIN rail mounting

4.1.1 DIN rail Installation

Installation Steps:

First step: Selected installation position, and make sure there is enough space.

Second Step: Fix the upper part of DIN rail seat on the DIN rail, Rotate the device from the bottom as shown by arrow 2(please see the installation instruction bwlow), then the DIN rail seat is installed on DIN rail.

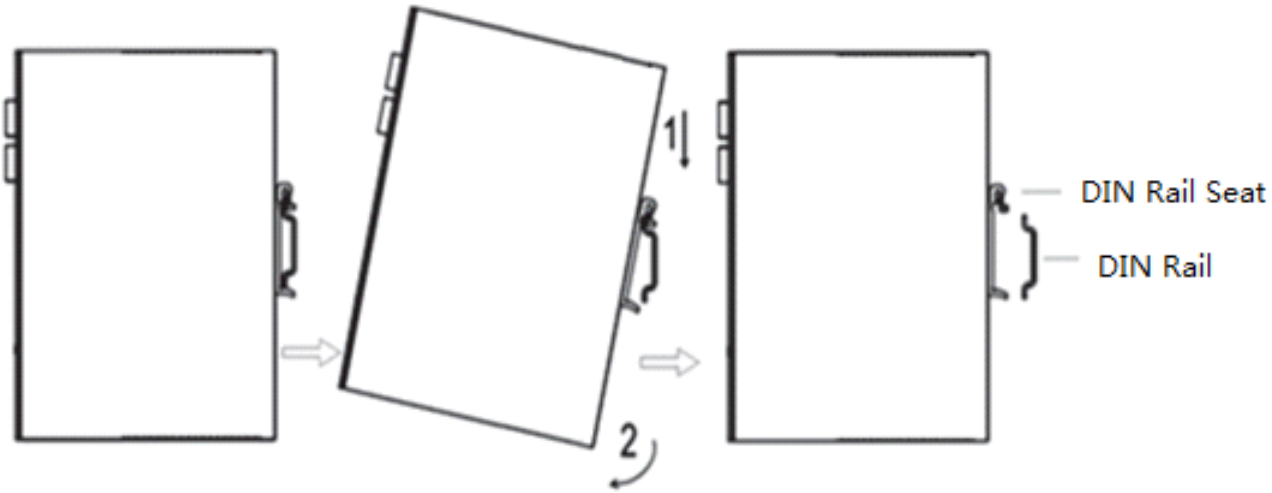


4.1.2 DIN rail disassembly

Disassembly Steps:

First step: As shown the arrow 1 in the picture below, Press downward the InGateway to make sure the bottom have the enough space to break away from the DIN rail.

Second step: Rotate InGateway to the direction of arrow 2, and move outward the bottom of InGateway. Once the the bottom break away from the rail seat, InGateway can be removed from the DIN rail.



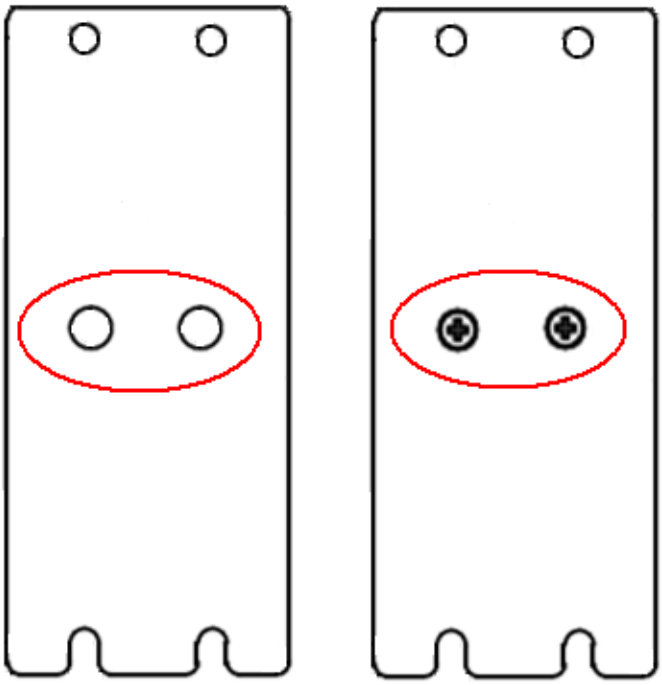
4.2 Wall Mounting

4.2.1 Wall Mounting Installation

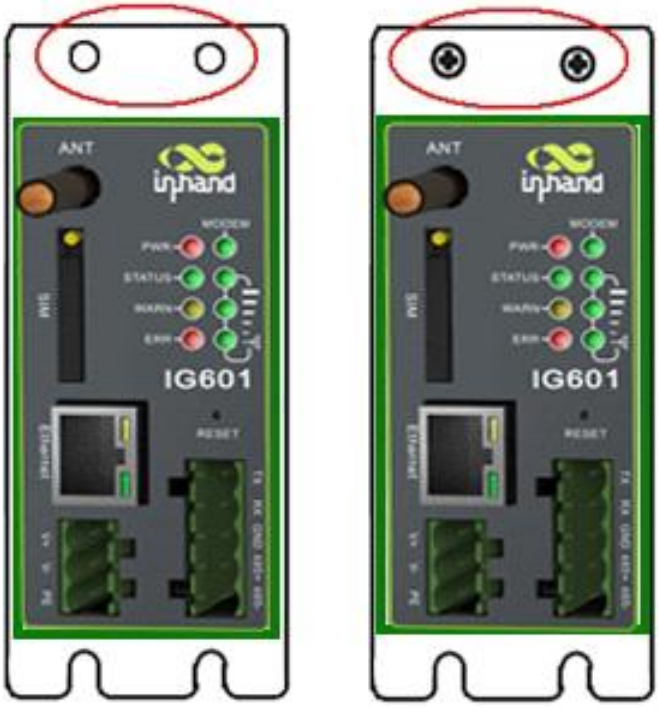
Installation Steps:

First step: Select the right installation location and make sure have enough space.

Second step: Use a screwdriver to install the wall mounting plate in the rear of the InGateway. As shown in picture below:



Third step: Take out the screws (packed with wall mounting plate), use a screwdriver to fix the screws to the mounting position, and drop down the InGateway to make the InGateway keep in a stable location, as shown in figure below.



4.2.2 Wall Mount disassembly

Disassembly Steps:

Remove the all screws using a screwdriver. Then the InGateway can be removed from the installation

location.

4.3 SIM Card Installation

InGateway support dual card. Press the SIM card eject button and will pop up the corresponding card slot. Insert a SIM card to the slot, as shown in figure below:

4.4 Antenna Installation

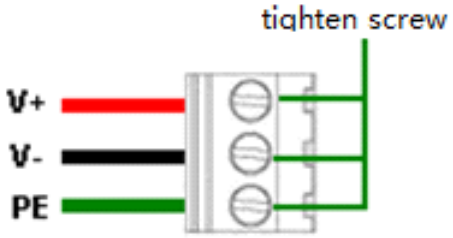
Gently rotate the movable part of the metal SMA interface until it cannot be rotated (the external thread of antenna cable cannot be seen at this point). Do not wring the antenna hardly by holding the black rubber.

4.5 Power Supply Installation

Installation Steps:
First step: Remove the power terminal from the InGaeway.

Second step: Loosen the locking screw of the power terminal

Third step: Plug the power cable into the power terminal and lock the locking screw.



4.6 Ground Terminal Installation

Installation Steps:
First step: Screwed down the ground terminal nut.

Second step: Fix the grounding ring of the ground wire to the grounding stud.

Third step: Tighten the ground terminal nut.

Attention

In order to improve anti-jamming capability of InGateway, the InGateway must be grounded when using. According to the on-site environment, connect the ground wire to the ground stud of the InGateway.

4.7 Connect Cable

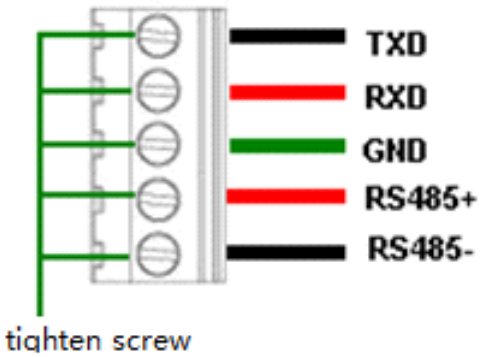
Connect InGateway to PC directly with a network cable.

4.8 Terminal connection

The connection method of Serial interface are used industrial terminal connection, please connect the cable to the corresponding terminal inrerface before using.

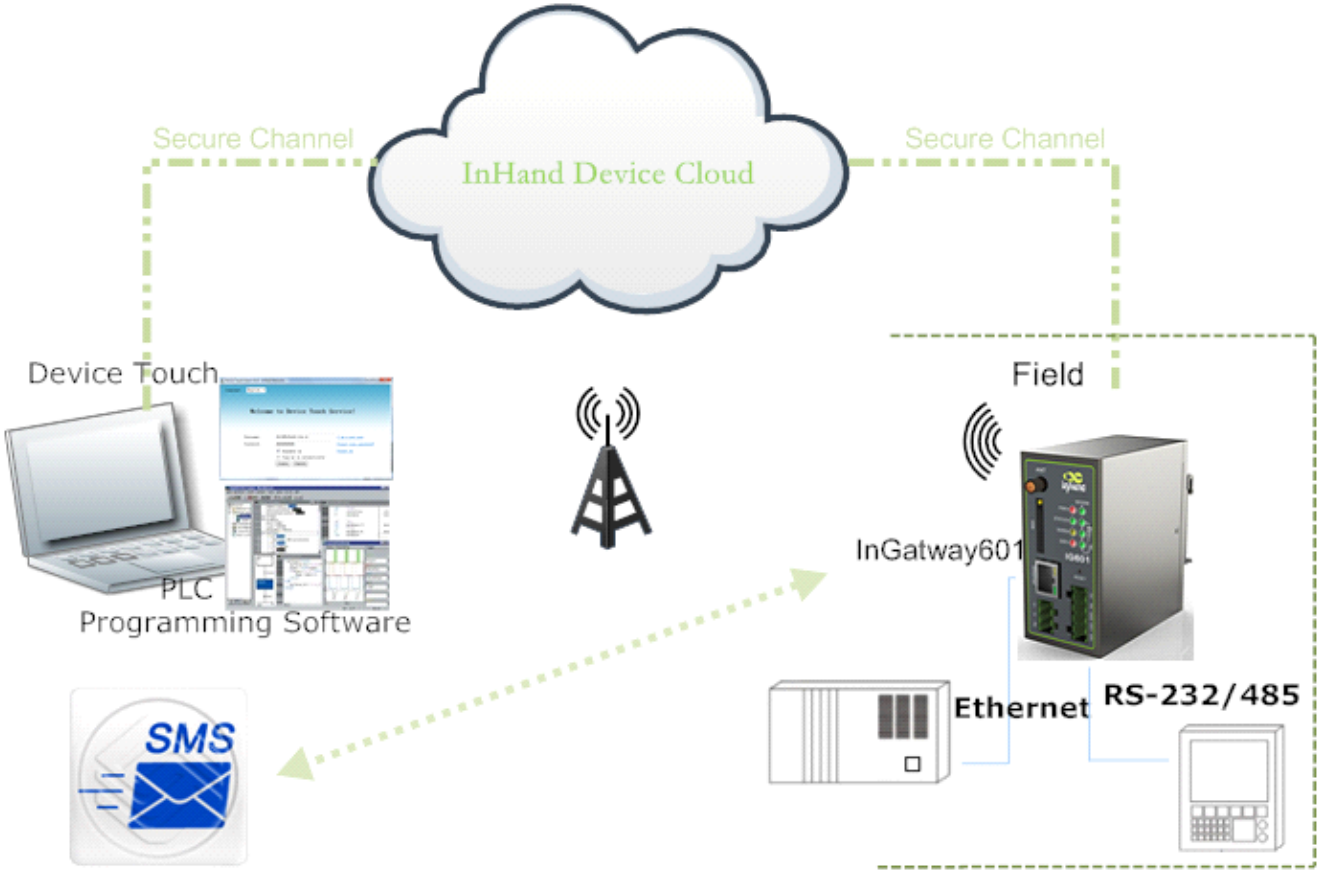
InGateway provide two serial interface modes - RS232/RS485.

When installing, remove the terminal from the device, loosen the locking screw on the terminal, and insert the corresponding cable into the terminal and then tignten the screw. The terminal interface description as the picture below:



Applications

With the development of industry and the popularity of automated equipments, equipment manufacturers are now facing increasingly large amount of maintenance work and other problems like: How to prevent unexpected downtime of automation equipment? How to monitor the operating status of the device? How to reduce engineer's travel for maintenance? InHand Networks, combining market and user's needs, provides complete remote maintenance solutions for automation equipments. As a gateway, IG601 build a secure channel between remote equipments, device cloud platform and maintenance engineers. Please see the network diagram below:



Appendix I FQA

1, InGateway is powered on, but can`t access Internet through it?

Please check：

- Whether the InGateway is inserted with a SIM card.
- Whether the SIM card is enabled with data service, whether the service of the SIM card is suspended because of an overdue charge.
- Whether the dialup parameters, e.g. APN, dialup number, username and password are correctly configured.
- Whether the IP Address of your computer is the same subnet with InGateway and the gateway address is InGateway LAN address.

2, InGateway is powered on, have a ping to detect InGateway from your PC and find packet loss?

Please check if the network crossover cable is in good condition.

3, Forget the setting after revising IP address and can`t configure InGateway r?

Method 1: connect InGateway with serial cable, configure it through console port.

Method 2: within 5 seconds after InGateway is powered on, press and hold the Restore button until the ERROR LED flashes, then release the button and the ERROR LED should goes off, press and hold the button again until the ERROR LED blinks 6 times, the InGateway is now restored to factory default settings. You may configure it now.

4, After InGateway is powered on, it frequently auto restarts. Why does this happen?

Please check:

- Whether the module works normally.
- Whether the InGateway is inserted with a SIM card.
- Whether the SIM card is enabled with data service, whether the service of the SIM card is suspended because of an overdue charge.
- Whether the dialup parameters, e.g. APN, dialup number, username and password are correctly configured.
- Whether the signal is normal.
- Whether the power supply voltage is normal.

5, Why does upgrading the firmware of my InGateway always fail?

Please check:

- When upgrading locally, check if the local PC and InGateway are in the same network segment.

- When upgrading remotely, please first make sure the InGateway can access Internet.

6, After InGateway establishes VPN with the VPN server, your PC under InGateway can connect to the server, but the center can`t connect to your PC under InGateway?

Please make sure the firewall of your computer is disabled.

7, After InGateway establishes VPN with the VPN server, Your PC can`t connect to the server?

Please make sure “Shared Connection” on “Network=>WAN” or “Network=>Dialup” is enabled in the configuration of InGateway.

8, InGateway is powered on, but the Power LED is not on?

- Check if the protective tube is burn out.
- Check the power supply voltage range and if the positive and negative electrodes are correctly connected.

9, InGateway is powered on, but the Network LED is not on when connected to PC?

- When the PC and InGateway are connected with a network cable, please check whether a network crossover cable is used.
- Check if the network cable is in good condition.
- Please set the network card of the PC to 10/100M and full duplex.

10, InGateway is powered on, when connected with PC, the Network LED is normal but can`t have a ping detection to the InGateway?

- Check if the IP Address of the PC and InGateway are in the same subnet and the gateway address is InGateway LAN address.

11, InGateway is powered on, but can`t configure through the web interface?

- Whether the IP Address of your computer is the same subnet with InGateway and the gateway address is InGateway LAN address.
- Check the firewall settings of the PC used to configure InGateway, whether this function is shielded by the firewall.

12, The InGateway dialup always fails, I can`t find out why?

Please restore InGateway to factory default settings and configure the parameters again.

13, How to restore InGateway to factory default settings?

1. Press and hold the Restore button, power on InGateway;
2. Release the button until after the STATUS LED flashes and the ERROR LED is on;
3. After the button is released, the ERROR LED will go off, within 30s press and hold the Restore button again until the ERROR LED flashes;

4. Release the button, the system is now successfully restored to factory default settings.

Appendix II Description of LED

The description of IG601's LED is shown below:

Name	Color	Description			
Power	Red	On	Power on	Off	Power off
Status		See the information below			
Warn	Yellow				
Error	Red				
Modem		On	Modem works normally	Off	Modem works abnormally
Signal(weak)		On	9≥Signal≥1	Off	No signal detected
Signal(medium)		On	19≥Signal≥10	Off	Signal≤9
Signal(strong)		On	31≥Signal≥20	Off	Signal≤19

Some of the indicators are defined below:

STATUS	WARN	ERROR	Definition
On	On	Off	Power on
Blink	On	Off	Initialization succeed
Blink	Blink	Off	Dialing
Blink	Off	Off	Dialing succeed
Blink	Blink	Blink	Upgrading
Blink	On	Blink	Reset Succeed